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DIRECTORATE OF CIVIL AVIATION.

Annual Report
on the
Progress of Civil Aviation.

(April 1st, 1924—March 31st, 1925.)

*Presented to Parliament by
Command of His Majesty.*

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List of Previous Reports.

"Synopsis of Progress of Work in the Department of Civil Aviation, 1st May, 1919, to 31st October, 1919" (Cmd. 418, H.M.S.O., 2*d*.).

"Synopsis of Progress of Civil Aviation in Foreign Countries, up to 31st October, 1919" (Cmd. 476, H.M.S.O., 1*d*.).

"Half-Yearly Report on the Progress of Civil Aviation, 1st October, 1919, to 31st March, 1920" (Cmd. 800, H.M.S.O., 3*d*.).

"Half-Yearly Report on the Progress of Civil Aviation, 1st April, 1920, to 30th September, 1920" (Cmd. 1073, H.M.S.O., 4*d*.).

"Half-Yearly Report on the Progress of Civil Aviation, 1st October, 1920, to 31st March, 1921" (Cmd. 1342, H.M.S.O., 6*d*.).

"Half-Yearly Report on the Progress of Civil Aviation, 1st April, 1921, to 30th September, 1921" (Cmd. 1559, H.M.S.O., 3*s*.).

"Half-Yearly Report on the Progress of Civil Aviation, 1st October, 1921, to 31st March, 1922" (Cmd. 1710, H.M.S.O., 6*d*.).

"Annual Report on the Progress of Civil Aviation, April 1st, 1922, to March 31st, 1923" (Cmd. 1900, H.M.S.O., 9*d*. net).

"Annual Report on the Progress of Civil Aviation, April 1st, 1923, to March 31st, 1924" (Cmd. 2210, H.M.S.O., 1*s*. net).

To Lieut.-Colonel the Right Hon. Sir Samuel J. G. Hoare,
Bart., C.M.G., M.P., Secretary of State for Air.

ANNUAL REPORT ON THE PROGRESS OF CIVIL AVIATION.

1st April, 1924, to 31st March, 1925.

PART I.—GENERAL.

RELATIONS WITH FOREIGN COUNTRIES.

International Commission for Air Navigation.

The permanent International Commission instituted in accordance with Article 34 of the Convention for the Regulation of Aerial Navigation (Paris, 13th October, 1919) held one session during the year under review, and the usual meetings of the Technical Sub-Commission have also been held. The seventh session was held in Paris from 10th to 14th October, 1924, at which Roumania and Uruguay were represented for the first time.

The States which are now parties to the Convention are :—

Belgium.
Great Britain.
Canada.
Australia.
South Africa.
New Zealand.
India.
Irish Free State.
Bulgaria.
Czechoslovakia.
France.
Greece.
Italy.
Japan.
Persia.
Poland.
Portugal.
Roumania.
Kingdom of the Serbs, Croats, and Slovenes.
Siam.
Uruguay.

Poland has deposited her ratification of the Convention since the last session.

Bolivia, who was one of the original signatories to the Convention, denounced the Convention, with effect from 30th August, 1924.

The Protocol of Amendment of Article 5, adopted by the International Commission for Air Navigation at the second session, held in London in October, 1922, will come into force, in accordance with its final clauses, when the following three outstanding States who are parties to the Convention shall have deposited their ratification: Japan, Persia, Kingdom of the Serbs, Croats and Slovenes.

The Protocol concerning an amendment of Article 34, amending the system of voting on the International Commission for Air Navigation, adopted by the Commission at the fourth session held in London in June, 1923, will come into force in accordance with its final clauses, when the following five outstanding States who are parties to the Convention shall have deposited their ratifications: Japan, Persia, Portugal, the Kingdom of the Serbs, Croats and Slovenes, and Siam.

Temporary Agreements with Foreign Powers.

Provisional air traffic agreements are in force with Denmark, Holland, Norway, Sweden and Switzerland. The agreement with Holland was finally ratified on 7th January, 1925, the date on which ratifications of the agreement were exchanged.

The arrangement with Germany, whereby permission has been granted on a reciprocal basis, generally for periods of three months at a time, for the operation of British air services to Cologne and Berlin, has been continued.

In regard to the temporary agreement with Czechoslovakia which expired on 31st March, 1924, further discussions have taken place with the Government of Czechoslovakia with a view to the operation of a British air service to Prague, but, owing to the attitude of the German Government in regard to flight over Germany, it has not been possible to operate any services to Czechoslovakia.

THE CIVIL AVIATION ADVISORY BOARD

In view of the conclusion of the long-term agreement with Imperial Airways, Limited, under the terms of which the Company are free to develop their own policy for the expansion and for the exploitation of British air services in Europe, it was considered that, as the effect of the agreement would be in large measure to transfer to the company the consideration of those questions which might previously have called for examination by the Civil Aviation Advisory Board, the necessity for continuing the Advisory Board in existence was no longer justified.

The Civil Aviation Advisory Board was accordingly dissolved in July last.

COMMERCIAL AIR SERVICES.

Imperial Airways, Limited.

The four companies which had been operating with the aid of a subsidy, namely, Handley Page Transport, Limited; Instone Air Line, Limited; Daimler Hire, Limited, and the British Marine Air Navigation Company, Limited, terminated their individual existences on 31st March, 1924, when they were amalgamated in the formation of the new company, Imperial Airways, Limited, which came into existence on the 1st April, 1924.

The agreement entered into by the Government with this company stipulated that the company shall be formed with a nominal capital of one million pounds sterling and shall receive a subsidy spread over 10 years amounting to one million pounds sterling, the said subsidy to be paid at the rate of 137,000*l*. for the first four years, after which it will decrease until in the tenth year the company shall receive as a final payment 32,000*l*.

In return for this subsidy, the company undertakes to fly a minimum of one million miles per annum, except that during the first four years of its existence the minimum annual mileage may be in any one year 800,000 miles, provided that at the end of the first four years it shall have flown a minimum of four million miles. In addition, the company undertakes to operate, as a minimum, efficient air services for the transport of passengers, mails and freight between the following places :—

London–Paris ; London–Brussels ; London–Amsterdam ; and Southampton–Channel Islands, or an alternative route to be operated by seagoing marine aircraft.

The agreement also provides for the distribution of profits of the company as follows :—

(1) 10 per cent. on the paid-up capital of the company shall be made available for distribution amongst the shareholders of the company.

(2) The balance, if any, shall be divided into three parts :

(*a*) One-third shall be utilised for the repayment to the Government of the annual subsidy advanced.

(*b*) One-third shall be devoted to the development and improvement of the air services provided by the company.

(*c*) The remainder shall be available for distribution amongst the shareholders of the company.

The Government undertakes not to subsidise any other company during the period of the agreement for the operation of any heavier-than-air services operating in Great Britain and Europe (Europe for the purposes of this clause being considered as including the Mediterranean Sea and the Black Sea, and to be bounded on the east by the Ural Mountains, the Caspian Sea and the Caucasus Mountains).

The Government is represented on the Board of the Company by two directors of its own nomination.

Owing to difficulties which the company experienced in the process of reorganising and bringing under one control the several companies which had previously been operating, some delay occurred in opening up the services. The route London to Paris was opened on the 26th April, London to Brussels and Cologne on the 3rd May, London to Amsterdam–Hanover–Berlin on the 2nd June, and London–Paris–Basle–Zurich on the 17th June.

The Channel Islands service has only been operating spasmodically throughout the period under review, and it is anticipated will not be in regular operation before 1926.

Of the above, the service between London and Paris was operated not less than once a day in each direction, as also that between London, Brussels and Cologne; whilst an additional daily service to Cologne was operated *viâ* Ostend. The service between London and Berlin was operated, as at the end of the previous year, three times a week in each direction. On the alternate days the line was operated by the Deutscher Aero-Lloyd, working in conjunction with Imperial Airways, Limited. The previous arrangement whereby British aircraft of any type were allowed to operate on this route remained in force until 30th September, 1924, when the German Government stipulated that only machines which complied with the "Nine Rules" could be used over German territory on this service, except when on special occasions prior permission was obtained from the German Government to fly a larger type of machine. On 1st January, 1925, however, this latter concession was withdrawn, and from that date onwards only machines which complied with the "Nine Rules" were permitted to operate.

The service between London and Zurich (*viâ* Basle) was operated three times a week in each direction until the 17th November, when the services were closed down except for occasional special flights. This route has been re-opened with a daily service, and it is anticipated that it will continue through next winter.

It has still been impossible up to date to obtain permission from the German Government for the operation of the service to Prague in extension of the existing line from London to Cologne.

Imperial Airways, Limited, completed, in accordance with the terms of their agreement, a total mileage during the year of 825,525 miles, the monthly totals being :—

1924.—April	- - - -	1,350 miles.
May	- - - - -	46,590 ,,
June	- - - -	99,680 ,,
July	- - - -	146,820 ,,
August	- - - -	139,280 ,,
September	- - -	110,345 ,,
October	- - - -	72,175 ,,
November	- - -	47,280 ,,
December	- - -	36,420 ,,
1925.—January	- - - -	27,105 ,,
February	- - - -	43,810 ,,
March	- - - -	54,670 ,,
Total	- -	825,525 miles.

In connection with these mileages, it is of interest to note, as a further instance of the durability of British aircraft material under good conditions of inspection and maintenance, that up to 31st March, 1925, one aircraft of the Handley Page type and two of the De Havilland 34 type have each completed about 2,300 hours of flying, representing approximately 200,000 miles each; and three Napier "Lion" type engines have each run an average of 1,350 hours.

Northern Air Lines, Limited.

During the period under review, a new company has come into existence, namely, Northern Air Lines, Limited. This company, which had run a temporary experimental service in the previous year from Liverpool to Belfast, transferred its operations to Stranraer and opened a regular daily service in each direction between Belfast and Stranraer on the 17th March.

This company is operating without the aid of a subsidy and has been formed mainly to cater for the carriage of newspapers and mails between Northern Ireland and the south of Scotland, the service being timed to connect with the trains running to and from London. This service will probably be extended in both directions—on the one hand to Londonderry, and on the other to Carlisle. During the few days of its operation in the period under review, it has attained an efficiency of 100 per cent., and has carried approximately 5 tons of goods, in addition to five passengers. Its fleet consists of two D.H. 9 machines and one D.H. 50.

De Havilland Aeroplane Hire Service.

The volume of flying carried out by the De Havilland Aeroplane Hire Service shows some decrease upon the record of the previous year, owing to a certain extent to the decision of the company not to undertake the operation of temporary regular air services such as had been carried out in previous years, and also because of the prevalence of unpleasant flying weather.

Many highly successful flights, however, were carried out, not only in Great Britain, but also to distant destinations on the Continent. By means of these commercial flights, much data has been collected which has been useful in designing recent commercial types of aircraft tending to greater reliability and comfort.

The smaller mileage of the Hire Service is counterbalanced by the increased activities of the De Havilland School of Flying, an encouraging feature being the steadily increasing number of novices who are taking instruction.

Savage Skywriting Company.

The Savage Skywriting Company have continued operating in Great Britain, the U.S.A., and the Scandinavian countries, and have extended their sphere of activities into France, Canada and Cuba.

In Great Britain the company carried out a large contract which called for 400 demonstrations, covering every principal city and town in England, Scotland and Wales; this was operated by five machines and personnel.

The demonstrations given in Norway, Sweden and Denmark were operated by one pilot and two machines and the necessary working personnel.

The Canadian campaign was conducted from the company's New York office, but directed from London and operated by British machines and personnel.

The Island of Cuba was covered from end to end. This operation presented great difficulties, owing to the lack of aerodrome facilities on the island. In spite of these difficulties, the company, by dint of very hard work, succeeded in completing the contract to scheduled time.

During the year the company's machines flew approximately 800 hours: 300 in Great Britain, 300 in the U.S.A., and the remaining 200 hours in Scandinavia, Canada and Cuba. The company owns 22 machines and has four more under construction.

SURVEY OF ROUTE TO INDIA.

A flight to India and back was carried out by the Director of Civil Aviation, Air Vice-Marshal Sir W. Sefton Brancker, K.C.B., A.F.C., piloted by Mr. Alan Cobham, and accompanied by Mr. Elliott (Engineer).

This journey was undertaken in order to carry out a survey of the route to India. It was commenced on 10th November, 1924, and completed on 17th March, 1925. During that time a distance of approximately 18,000 miles was flown in a total flying time of 210 hours, and 15 countries were visited. The aircraft used was a D.H. 50, fitted with a Siddeley "Puma" engine; the same machine and engine were used throughout and gave the highest satisfaction.

On the outgoing journey the route flown was:—

London.
Paris.
Cologne.
Berlin.
Warsaw.
Deblin.
Lemberg.
Bucharest.
Constantinople.
Konia.
Alexandretta.
Rakka.
Ramadi.
Hinaidi (Baghdad).
Shaibah.
Bushire.
Bunder Abbas.
Charbar.
Karachi.
Bombay.
Delhi.
Allahabad.
Calcutta.
Akyab.
Rangoon.

A different itinerary was taken on the return flight, wherever an alternative presented itself, so that a comparison could be made with the route previously flown and the opportunity taken to visit certain countries and towns not already touched at.

The homeward route was therefore as follows :—

Akyab.
Calcutta.
Benares.
Allahabad.
Jhansi.
Datia.
Bharatpur.
Delhi.
Nazirabad.
Karachi.
Jask.
Bushire.
Ahwaz.
Baghdad.
Beyrout.
Aleppo.
Constantinople.
Belgrade.
Budapest.
Vienna.
Prague.
Böblingen.
Strasbourg.
Paris.
London.

In every country visited, views were exchanged with the responsible authorities as to the future development of air transport services, and the foundations were laid for further discussions. Keen interest in the possibilities of air transport was met with everywhere.

In India, an investigation was carried out, in conjunction with the Director of Airship Development, Group Captain P. F. M. Fellows, D.S.O., into the question of sites for airship bases, and schemes for internal air lines by aeroplane or flying boat were discussed with the Indian Air Board.

The general impression gained from the flight was that a regular aeroplane service from England to India and on to Burma is quite feasible from a technical standpoint. The route from England to Rangoon, with the exception of the Taurus and Lebanon mountains, presents extraordinarily favourable physical conditions for regular flying, even in bad weather.

AIR SURVEY.

The use of aerial photography as an aid to ground survey continues to make progress, but naturally more rapidly in countries which are less well surveyed than Great Britain. The investigation of methods of rectification and plotting by the Air Survey Committee has steadily continued. The Directorate of Civil Aviation is now represented on this Committee.

In Great Britain, aerial photography has, up to the present, been limited to mosaics of small areas and individual oblique and vertical photographs for commercial purposes. Aerofilms, Limited, have been taken over by the Aircraft Operating Company, Limited. This company has carried out 120 hours photographic flying. The work has included the making of mosaics, rectified and adjusted to scale with the Ordnance Survey maps, of a country estate and a congested town area in Southampton. An interesting new feature of the photographic work of this company is a series of educational photographs for the teaching of economic geography. Progress photographs have been much in demand, particularly in connection with new road works, *e.g.* the new Great West road, and the new London–Southend road. The company has also supplied a large number of photographs for industrial planning and publicity; in the case of town planning schemes, panoramic oblique photographs have proved very useful. An increased demand for photographs for archæological survey has been experienced consequent on the publication of the official report on Air Survey and Archæology.

A new company dealing with aerial photographic survey has been registered—the Air Survey Company, Limited—to carry on the business started by Mr. R. C. Kemp with the survey of the Irawaddy Delta. This company has continued to operate in the east, and has, during the past year, been engaged on further surveys of forest regions in Tenasserim. The country is rough and hilly and seaplanes are being used for the work as in the case of the Irawaddy Delta.

The Central Aero-Photo Company, Limited, have recorded an increased demand for aerial photographs, but in common with other firms operating in England have been very badly hampered by weather. Some firms have placed regular orders for photographs to show developments in their premises from year to year. Evidence of the definite establishment of aerial photography as a normal trade facility is provided by the fact that the orders received from a particular trade fluctuate according to the state of prosperity of the trade concerned. Before such a relationship existed the bulk of the orders were to be regarded as experimental.

The Surrey Flying Services, Limited, have taken over the business of Airco Aerials, Limited, and have carried out a large amount of photographic work. This is the only photographic firm which employs its own machines. All kinds of work have been carried out, but one of the chief features of the work of this firm is the production of picture postcards.

LIGHT AEROPLANE CLUBS.

In order to encourage the practice of flying among the general public, with freedom from any military liability or Government control, a scheme is under development for the formation of up to six light aeroplane clubs, the running of which will be assisted by the Government.

Five clubs are already in process of formation and negotiations concerning the terms of the assistance to be given by the State are progressing. It is hoped that it will be possible for the clubs to be offered and to find acceptable an arrangement under which each club will receive an initial grant of 2,000*l.*

to enable it to purchase a number of light aeroplanes of approved types, a grant not exceeding 1,000*l.* towards expenses and maintenance during the first year and a further grant not exceeding 1,000*l.* during the second year, the actual amount of the second year's grant to be based on the first year's operations.

The following are the five clubs now being formed :—

London Light Aeroplane Club (Stag Lane Aerodrome).
Midland Aero Club (Castle Bromwich Aerodrome, Birmingham).
Lancashire Aero Club (Woodford Aerodrome, near Manchester).
Newcastle-on-Tyne Aero Club (Aerodrome not yet fixed).
Yorkshire Aeroplane Club (Brough Aerodrome and a second aerodrome in Yorkshire).

A suitable type of light aeroplane and engine has been produced and it is anticipated that the clubs will be in possession of machines and be able to commence active operations this summer.

TRAINING OF RESERVE OFFICERS.

The four civil Schools referred to in the last report have continued the training of Reserve officers and a fifth School, for the instruction of pupils on twin-engined aeroplanes and seaplanes, was opened at Brough, East Yorkshire, by the North Sea Aerial and General Transport Limited, on 21st May, 1924. The number of complete courses carried out during the period under review was as follows :—

The De Havilland Aircraft Company, Limited, Stag Lane Aerodrome, Edgware - - - - - - -	92
The Bristol Aeroplane Company, Limited, Filton, Bristol - - - - - - - - - - - -	87
W. Beardmore & Company, Limited, Moorpark Aerodrome, Renfrew, N.B. - - - - - - -	69
Sir W. G. Armstrong-Whitworth Aircraft, Limited, Whitley Aerodrome, Coventry - - - - -	55
The North Sea Aerial & General Transport Limited, Brough, East Yorkshire - - - - - - -	32
Total - -	335

On 31st March, 1925, the number of pilots in Class A and AA of the Reserve was approximately 510.

The seaplane section of the school at Brough was opened during March, 1925, and it is hoped that about 25 officers will receive instruction on a modern type of float seaplane at this school during the year.

Lectures on Air Pilotage have been added to the course of training at the schools. The instructors have been given instruction in this subject and the schools are equipped with the necessary instruments.

AIRSHIPS.

In accordance with the policy outlined in the last Report, a contract for a 5,000,000 cubic ft. airship has been placed with the Airship Guarantee Company and progress has been made in the design of this airship and of that of a similar capacity which will be constructed by the Air Ministry.

The Air Ministry representatives who visited India at the end of last year made a thorough examination of possible airship bases at Karachi, Bombay, Madras, Calcutta, Delhi, and Colombo. As a consequence of discussions with the Indian Air Board the Standing Finance Committee of the Indian Legislative Assembly have recommended that approval should be given for the leasing rent-free to the British Government of a suitable site at Karachi and for a grant-in-aid approximately equal to the import duties on the materials to be employed in the construction of the base.

The airship R. 33 has been reconditioned and prepared for certain experimental flights which are to be undertaken before the design of the larger type of airship is completed. (On 16th April, 1925, this airship broke loose from its mooring mast at Pulham in a gale and was carried over the North Sea to the coast of Holland, whence it returned under its own power next day, considerably damaged in the bows. The fact of the airship's ability to ride out the storm although damaged and to return safely after an unexpected cruise of 30 hours was convincing proof both of the soundness of design of this comparatively old type of airship and of the thoroughness of the inspection and reconditioning work which was carried out on it.)

Reconditioning of the R. 36 has begun and it is intended to carry out, in addition to the aerodynamical experiments referred to above, mooring mast tests and other tests under semi-tropical conditions by a flight to Egypt during the late spring of next year.

EXHIBITIONS, COMPETITIONS, ETC.

On the occasion of the Third International Aeronautical Exhibition held at Prague from 31st May to 9th June, 1924, as in the case of the Gothenburg Exhibition in the previous year, the British aircraft trade was assisted to participate by the Government to the extent of one-half of the expenses incurred. For the Prague Exhibition, a sum of 6,000*l*. was allotted for this purpose from Air Ministry funds.

The British exhibit, consisting of four complete aircraft, six aero-engines and miscellaneous accessories, created a very favourable impression, which was heightened by the fact that the opening of the exhibition was attended by the Secretary of State for Air and the Director of Civil Aviation, who made the journey to Prague by air.

A two-seater light aeroplane competition was held at Lympne from 27th September to 4th October, 1924. This competition successfully fulfilled its object of demonstrating that two-seater light aeroplanes could be produced that would be cheap to run and suitable in every way for training and sporting flying. It indicated, however, that for this type of machine engines were required of rather higher power than those limited to a maximum of 1,100 c.c. which were permitted by the rules of the competition.

The prizes of 2,000*l*. and 1,000*l*. presented by the Air Ministry were won by, respectively :—

The Beardmore " Wee Bee," Bristol " Cherub " engine.
The Bristol " Brownie," Bristol " Cherub " engine.

The Grosvenor Cup Race for light aeroplanes, which was held immediately after the competition for light two-seater machines, was won by the Avro " Avis," piloted by Mr. B. Hinkler. The King's Cup Race, a handicap open to all types of machines, aeroplanes and seaplanes, was held on August 12th and won by a D.H. 50, piloted by Mr. A. J. Cobham.

Owing to lack of entries, the Aerial Derby, which was to have been held in August, was cancelled.

Air transport will be represented this year at the British Empire Exhibition by a special section in H.M. Government Pavilion, and also by a large exhibit in the Palace of Transport and Housing. It is proposed to include in the latter a number of aircraft and engines of Service and civil types, an aerial lighthouse, an airship power car, an apparatus for testing the physical qualifications of candidates for a pilot's licence (loaned by the Royal Aero Club), and a replica of the air traffic control tower at Croydon aerodrome, in which the conversations actually taking place between the control officer at Croydon and pilots flying on the air lines will be reproduced by a loud speaker.

ESTIMATES, 1925–1926.

Provision is made in 1925–26 (Air Estimates, Vote 8) for a total gross expenditure on civil aviation of 369,500*l*., offset by receipts which are expected to amount to 12,500*l*., giving a net expenditure of 357,000*l*. 35,000*l*. is provided for the staffing and maintenance of civil aerodromes; 37,000*l*. for aerial routes, surveys, &c.; 12,000*l*. for technical equipment; 123,000*l*. for works, buildings and lands (of which 50,000*l*. is for the reconstruction of the London Terminal Aerodrome, Croydon, and 29,500*l*. for the diversion of a public road in connection with the improvement to the aerodrome); and 159,500*l*. for subsidies (of which 137,000*l*. is provided for payments to Imperial Airways, Limited) and 22,500*l.* for the purpose of assisting the formation of six Light Aeroplane Clubs.

In addition, a sum of 15,562*l.* is estimated as the cost of the headquarters' staff of the Directorate of Civil Aviation (Air Estimates, Vote 10).

AIR NAVIGATION REGULATIONS.

Additional directions were issued on 24th July, 1924, amending the medical requirements in respect of applicants for the issue of a private pilot's (A) licence; for a (B) licence to fly passenger or goods aircraft; and on 29th December, 1924, removing Manchester aerodrome (Alexandra Park) from the list of customs aerodromes.*

LICENCES AND CERTIFICATES.

The following licences and certificates were granted during the period under review :—

	New Licences or Certificates issued during the year.	No. of Licences or Certificates current on 31.3.25.
Licences for Pilots - - -	40	140
Licences for Navigators - -	2	3
Licences for Ground Engineers -	90	294
Licences for Aerodromes - -	130	44
Certificates of Registration :—		
Heavier-than-Air Craft - -	80	184
Lighter-than-Air Craft - -	2	7
Certificates of Airworthiness :—		
Heavier-than-Air Craft - -	128	186
Lighter-than-Air Craft - -	1	1

A new form of certificate of registration for aircraft approved by the International Commission for Air Navigation, has been introduced, and arrangements have been made for the preliminary medical examination of new applicants for Class "B" pilots' licences. Such examination may be carried out by the candidate's private medical practitioner, or, if he so desires, by the Medical Adviser to the Director of Civil Aviation.

GROUND ORGANISATION.

Air Ports and Landing Grounds.

The scheme for the expansion of Croydon aerodrome is progressing. A Bill known as the "Air Ministry (Croydon Aerodrome Extension) Bill," providing for the closing of a portion of Plough

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* A.N.D. 3D. and A.N.D. 4B., respectively. (H.M. Stationery Office, price 2*d.* and 1*d.* each net.)

Lane and the construction of a new road to take its place, is now before Parliament. It has been decided to site the new buildings on the east side of the aerodrome, on land adjoining the new diversion road from Thornton Heath to Purley which bounds the aerodrome. The first part of the work to be undertaken will be the provision of the two 2-bay hangars, each 300ft. by 150 ft., and the necessary administrative buildings. When this work has been completed and the buildings are available for use, the buildings at present in use, with the possible exception of a large permanent hangar, will be demolished.

An improvement to the take-off in a south-westerly direction has been effected by the removal of certain buildings of the present station and by cutting down trees bordering Plough Lane. Work in connection with the improvement of the surface of the present aerodrome has also continued.

In consequence of the termination of the service between London and Manchester, the Manchester aerodrome was closed down on the 31st August, 1924, and has now ceased to exist. A site for an aerodrome at Woodford, approximately 10 miles south of Manchester has, however, been acquired by A. V. Roe and Company, Limited, and it is hoped that this will be open for public use during the current year. This site has the advantage of being outside the Manchester fog area.

Night Flying Equipment.

In continuation of the equipment of the London–Continental route for night flying, a considerable amount of experimental and test work was carried out during the year.

As foreshadowed in the last report, the emergency landing grounds at Penshurst and Littlestone have been equipped with A.G.A. automatic beacon lights, and the boundaries of these two landing grounds and of the aerodromes at Croydon and Lympne have been outlined with automatically operated lights. In addition, improvements have been effected in the arrangements for flood lighting the landing area at Croydon, in order that the maximum possible good landing area may be utilised during night operations.

The problem of maintaining regular services during the prevalence of fog and mist has received special attention; and, by utilising a captive balloon during days and nights of dense fog, much valuable information on the efficiency of sundry lighting units has been obtained. As a result of exhaustive experiments a new type of beacon has been installed at Croydon aerodrome, consisting of a number of glass tubes filled with Neon gas which is made incandescent by passing through it a high intensity electric current. The resultant rich red glow is of considerable value to aircraft endeavouring to locate the aerodrome under conditions of bad visibility.

It is intended to continue these experiments during the winter of 1925–26, and to endeavour to produce a scheme involving the employment of the well-known leader cable principle, used in connection with Neon tubing. This scheme will, it is hoped, enable aircraft to operate from aerodromes during really dense ground fog, when it is possible to fly above the fog but, under present circumstances, impossible to depart or land with safety.

A large number of experimental night flights have been carried out in order to obtain data, and a certain amount of progress has been made in the production of lighting equipment to be carried on aircraft during night work.

The study of acoustical methods of assisting aircraft to land in fog by the Signals Experimental Establishment of the Royal Engineers has continued. While the method shows promise, it has still not yet reached the stage where it can be put to practical use.

Navigation.

The proposal for the revision of the conditions of issue of navigators' licences and the conditions in which licensed navigators shall be carried on commercial aircraft is still under discussion by the International Commission for Air Navigation.

The question of instruments and equipment for navigation to be carried by civil aircraft has been studied by a committee, with a view to revising the existing regulations when the International Commission for Air Navigation has come to a decision on the above question.

Specifications of requirements for the design of new instruments for navigation in fog and low visibility have been drafted and circulated to certain scientific bodies.

International Aeronautical Maps.

On account of the small demand for special maps for aviation and the fact that other contracting States to the International Air Convention have not produced their share, the production of the International Aeronautical Maps in this country is being stopped.

Five general sheets (Britain, Balkans, Egypt, Iraq, and Oman) have already been published, and three other sheets (Kordofan, Yemen, and Baluchistan) are nearly completed.

Further work on local sheets in accordance with the provisions of the International Air Convention is being stopped, but a strip of map of the London–Paris route on a scale of 1/500,000 is almost complete and will be published.

Information.

A book entitled the *Air Pilot, Great Britain,** was published in November, 1924, with the object of providing pilots and others interested with full information regarding the facilities for civil flying and the conditions affecting aviation in this country.

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* H.M.S.O., price 32*s*. 6*d*. net.

Before the publication of this book, the information which it was desired from time to time to bring to the notice of pilots was issued in a series of Notices to Airmen.

These Notices were started in 1919 and were confined to information that could be classified broadly as "urgent." During the four years up to 1924 a large number of these Notices was issued. On the other hand, much important information that had not an urgent character, but was none the less important, was not published.

The contents of the Air Pilot consisted therefore of a consolidation of the information which had been published in the Notices to Airmen, with the addition of a considerable amount of further information which was required in order to give the book the character of a guide to flying in this country.

The book is kept up to date by a monthly publication entitled the *Air Pilot Monthly Supplement*, which is supplied to all holders of the "Air Pilot." The Monthly Supplement serves a further purpose in that it is the means whereby the process of consolidation and amplification can be extended to information regarding flight in foreign countries.

The Notices to Airmen are being maintained as the channel for the rapid dissemination of information of actual urgency.

No change has been made in the system of notifying technical information affecting civil aircraft through the medium of Notices to Ground Engineers.

Wireless Communications.

Further use has been made by pilots during the past year of the Wireless Direction Finding stations at Croydon and Pulham; and further instances have occurred where by means of courses given by the Croydon station or positions given by both Croydon and Pulham flights have been carried out under conditions which would otherwise have proved impossible for flying. The establishment of a third British Direction Finding station at Lympne aerodrome, Kent, will greatly increase the scope of this work.

A scheme is under consideration by the various governments concerned for the inclusion of all Direction Finding stations working in connection with civil aviation in a uniform D.F. organisation. This scheme covering a greater part of the existing airways will, it is hoped, be in operation during the present summer.

Consequent upon a request from Imperial Airways, Limited, an officer of the Signals Branch, Air Ministry, delivered to the pilots of this company a course of eight lectures on the theory and practice of aircraft wireless.

As a result of the opening of the Carlisle–Stranraer–Belfast air line by Northern Air Lines, Limited, the Belfast station, situated at Malone Road aerodrome, has been re-opened.

The re-starting of airship flying has necessitated the refitting of H.M.A. R.33 with wireless telegraphic and telephonic apparatus, and steps are also being taken to refit H.M.A. R. 36 on the same lines. A considerable amount of additional work has been undertaken by the Pulham Station in this connection.

Negotiations are in progress with a view to the improvement of the wireless service afforded by French and Swiss stations on the Paris–Zurich sector of the London–Zurich airway and it is expected that through the measures kindly undertaken by the Governments concerned this sector will soon be well organised.

A large amount of traffic has been handled by the Air Ministry Stations at Guernsey and Lerwick on behalf of the Post Office during occasions when the Post Office cables connecting these centres to the mainland have broken down, thus ensuring continuity of communications for the public.

Experiments are being made by the Air Ministry as to the possibility of using wavelengths of the order of 150 to 250 metres, with fixed aerials, on commercial aircraft.

A scheme for remodelling the whole wireless installation at the London Terminal Aerodrome, Croydon, when the aerodrome is reorganised in the near future, is under consideration.

Meteorology.

The meteorological services for civil aviation have been maintained on the established lines. On the London–Continental routes, the services of hourly route reports commenced at 3 a.m. G.M.T. during the summer months and at 5 a.m. G.M.T. during the winter months. At various times during the year, however, additional observations were made after the normal hours in connection with night flying tests.

As from September, arrangements have been in force whereby important changes in visibility at meteorological stations on aerial routes are immediately communicated to the pilots of aircraft in flight and also transmitted by W/T to the continental terminal aerodromes. The arrangements were extended as from 1st January to include important changes in cloud height, weather and wind force. The latter reports are communicated by R/T to aircraft but are not transmitted to the Continent.

The meteorological service for the London–Manchester route was suspended on 1st April when the route was closed. The station at Manchester Aerodrome was closed on the 28th August.

Between the 22nd May and 5th June, a meteorological service was provided in connection with the Liverpool–Belfast air route. A station was opened at Belfast aerodrome and weather reports were received regularly from Little Ross lighthouse, Port Patrick coastguard station and Donaghadee coastguard station, by arrangement with the appropriate Government departments. Forecasts for this route were supplied by the meteorological officer at Sealand Aerodrome.

The station at Belfast and the system of reports from auxiliary stations were maintained for the Carlisle–Belfast air service which operated between the 29th August and the 3rd November.

In connection with the service from Stranraer to Belfast, the station at Belfast was re-opened on the 13th March and regular reports obtained from Donaghadee coastguard station from the 14th March.

The meteorological arrangements for the Southampton–Guernsey route were suspended on the 1st March when the route was temporarily closed.

A system of special reports and forecasts was organised in connection with the King's Cup Race in August, reports and forecasts were supplied in connection with the Light Aeroplane Meeting at Lympne in September, and at various times reports and forecasts were supplied to aircraft companies and to private pilots.

During the year reports were prepared on the meteorological conditions affecting civil aviation over the following routes and areas.

(1) Croydon to Cologne.
(2) Cologne to Prague and Zurich to Vienna.
(3) Coasts of the Adriatic.
(4) England to India.
(5) West Indies and Northern Coast of South America.
(6) Singapore to Batavia.
(7) Hong Kong to Shanghai.
(8) Berlin to Bucharest.
(9) Cairo to Karachi.
(10) Cape Town to Durban.
(11) Cape Town to Pretoria.
(12) Paris to Madrid *via* Marseilles.

A gazetteer of meteorological stations on the civil air route in S.E. England was prepared and copies forwarded to the Meteorological Services at Paris, Brussels and Utrecht.

A meteorological service for airships was inaugurated in January. Work has been commenced in connection with the organisation of meteorological reports on the proposed England–Egypt–India airship routes, and special investigations into meteorological conditions along these routes and at proposed airship bases are being undertaken.

TECHNICAL SERVICES.

General.

Further work has been done in defining the minimum flying requirements for civil aircraft. Definite minimum requirements as regards take-off and landing have been formulated and are now operative for landplanes, but the corresponding requirements for seaplanes have not yet been determined.

Experiments are still proceeding with a view to accumulating data on which the minimum requirements as to stability and controllability can eventually be based. The problem is one of no little difficulty, and nothing definite can yet be laid down.

Considerable progress has been made in the development of metal construction, and designs are available for metal planes up to any size likely to be used for some years in civil flying.

A great deal of attention has been directed at the attainment of an adequate degree of control at and beyond stalling angles. A method of aileron control which, besides giving control at low speeds, also eliminates the yawing introduced by operation of a normal aileron, has been devised and is being developed.

When fully developed, this will largely minimise, if not entirely remove, the danger at present inseparable from an involuntary stall close to the ground.

Experiments are still proceeding on engine silencing and cabin heating and ventilation—all of which have vital bearing on the comfort of passengers—but progress is slow, and no definite conclusions have been reached.

Experiments on sleeve valves engines are continuing, and have shown that this form of construction is likely to prove very satisfactory as regards reliability. A complete aero engine of 450 H.P. is now almost ready for testing on the bench. On a single cylinder it has been found that up to 8½ ins. diameter no troubles are experienced, and experiments are in hand with cylinders of even larger bore than this.

The compression-ignition system using heavy oil has now been incorporated into complete aero engines, which, it is hoped, will shortly be in the air. In so far as the injection system is concerned, very little trouble is experienced, all the difficulties met with so far being of a mechanical nature inside the engine itself, due to the higher maximum pressures developed in this type of engine.

The development of the air-cooled radial engine for air transport is being further pushed, and, judging by experience obtained on other duties, this type should prove a considerable advance on the water-cooled engine on the score of upkeep, when employed in air transport work.

Experimental Aircraft—Landplanes.

Two experimental landplanes for civil purposes have been completed during the past year, the "Hamilton" and the "Andover":—

Handley Page "Hamilton" (2 Siddeley "Puma" and 1 Rolls-Royce "Eagle IX" Engines).—This is a triple-engined version of the earlier type aircraft W. 8B, and is the first British three-engined aircraft to be operated for civil purposes. This machine is fitted with the new gyro rudder control which has given excellent results up to date. It is now undergoing extensive trials by Imperial Airways, Limited.

Avro "Andover" (1 Rolls-Royce "Condor" Engine).—This is a single-engined aircraft developed from the "Aldershot" bomber, primarily as an ambulance aircraft, but it has been converted into a freight carrier and will be handed to Imperial Airways, Limited, for extended test.

The following landplanes are under construction :—

European Transport.—Two types are under construction for operation on the London–Paris or equivalent route. One of these, built by the De Havilland Aircraft Company, Limited, is to be equipped with a single Rolls-Royce "Condor" engine; the other, built by Handley Page, Limited, is to have three Bristol "Lucifer" engines.

Middle-East Transport.—Two types intended for use under Middle East conditions are being constructed, one by A. V. Roe and Company, Limited, the other by Sir W. G. Armstrong Whitworth Aircraft, Limited. Both have three radial air-cooled engines, the first having the Bristol "Jupiter" and the second the Siddeley "Jaguar" engine. It is not likely that these aircraft will be available for test before the end of the current year.

Beardmore 3-engined Monoplane.—A large three-engined, all-metal cantilever monoplane is being built by William Beardmore and Company, Limited. Whilst primarily intended as an experiment to determine the value of the particular method of construction, it is designed to fulfil the same duties as the aircraft for Middle-East transport and will be comparable with them.

Experimental Aircraft—Seaplanes.

The following types of seaplanes for civil duty have been completed during the year :—

Supermarine "Swan."—This boat amphibian was originally designed for two Rolls-Royce "Eagle IX" engines, but Napier "Lions" have since been installed. Type trials have been completed and the aircraft has been proved to be satisfactory. Since the trials, which were made with the aircraft equipped as a Service type, the machine has been completed as a freight carrier, and is now stored pending resumption of the seaplane service of Imperial Airways, Limited.

Fairey "Freemantle."—This is a four-seater float seaplane with one Rolls-Royce "Condor" engine, and has completed makers' preliminary trials. It should be completely equipped and ready for delivery in May. It is intended for long-distance duty.

New Types of Aircraft.

The following types are under consideration and will be ordered during the coming year :—

(1) A freight carrier to carry a paying load of 8¼ lbs./H.P. on the London–Paris route.

(2) A small, short stage, boat seaplane with two Siddeley "Lynx" engines.

(3) A large seagoing boat seaplane with three Rolls-Royce "Condor" engines. This will be designed to carry 30 passengers and have a range of 500 miles.

Instruments, &c.

The following instruments and apparatus have been undergoing test during the year :—

Turn Indicators.—Reid, Sperry and Electric types.

Air logs.

Compasses.—New types P. 2 and O. 1.

General electrical equipment for aircraft.

Cockpit lighting.—Tests to determine the most suitable colour for night flying indicate, so far, that a red light is preferable.

Fog landing system.—The system referred to under "Night Flying Equipment" on pages 17–18 is being developed at the Royal Aircraft Establishment, and will shortly be tried out in full scale on Farnborough aerodrome.

Beacons.—A design has been prepared of mechanism whereby the powerful flood light at Croydon may be converted into a revolving beacon. A strontium-coloured beacon has been tested and tests are now being made of a Neon beacon.

MEDICAL SERVICES.

The institution of the medical examination of pilots requiring "A" (private) licences has shown that the applicants are for the most part extremely normal and healthy individuals who would, in the majority of cases, be able to secure a "B" licence should they wish to do so. This is encouraging as showing that the effects of flying carried out during the war do not leave any permanent stigmata.

The medical examinations of "B" licence (public transport) pilots carried out every six months have now become greatly appreciated by pilots themselves as giving information which will help them to keep fit and well. It is no uncommon thing for a pilot who has given up public transport flying to keep up his "B" licence in order that he may still retain his right to the full and comprehensive overhaul that is given by the State for a nominal fee.

A comprehensive review of the medical aspects of Civil Air Transport was given in a lecture before the Royal Aeronautical Society on 5th March last and has been reprinted in the Journal of this Society for May. This review, together with the subsequent discussion, deserves the attention and study of all manufacturers of aircraft and employers of pilots.

INVESTIGATION OF ACCIDENTS TO CIVIL AIRCRAFT.

British Aircraft.

Twelve accidents, to which the Air Navigation (Investigation of Accidents) Regulations, 1922, were applicable, occurred during the period under review; this total number is about half that of the previous year.

Only one accident resulted in loss of life, but in this case the pilot and seven passengers were killed. The circumstances of this disaster, which occurred on the London–Paris route, were the subject of the first Formal Investigation to be held under the above regulations.

None of the other accidents to civil aircraft in this country caused more than trifling injuries to a pilot or passenger.

Causes of Accidents.

The following table, based on the reports of the Inspector of Accidents, gives a broad classification of these accidents and following it is a brief description of each case.

—	(*a*) Error of of judgment on the part of the pilot.	(*b*) Defect in aircraft structure or controls.	(*c*) Defect in engine or installation.	(*d*) Weather conditions.	(*e*) Other causes.	Totals.
(1) Established Air Routes.	2	—	1	—	1*	4
(2) Hire Services -	—	—	—	—	1	1
(3) Short Passenger Flights.	2	1	1	1	1	6
(4) Constructors' trials	—	1	—	—	—	1
Total - -	4	2	2	1	3	12

* Investigated by Formal Inquiry.

1. *Established Air Routes.*

Column (*a*).—One accident under this heading occurred when the pilot was engaged in landing tests for licensing purposes. Owing to heavy landing the undercarriage collapsed and the aeroplane was badly damaged, but the pilot was unhurt.

The other accident occurred at an aerodrome on the Continent. It appears that when the aircraft was taking-off, loaded with goods only, the tail skid carried away the top wire of the aerodrome fence. The pilot fearing that he would be unable to clear the obstacles ahead, attempted to make a turn but the wing tip struck the ground and threw the machine on to its nose. An outbreak of fire occured and the aircraft was completely destroyed, but the pilot escaped injury.

Column (*c*).—The engine failed to develop full power as the aeroplane left the ground and the pilot was unable to maintain sufficient height to reach a possible landing ground. In avoiding a collision with trees the pilot stalled the machine which fell to the ground and was wrecked. None of the occupants was injured.

Column (*e*).—After taking off and climbing a few hundred feet the aeroplane turned through 180 degrees and headed back towards the aerodrome while gradually losing height. At a distance of about three quarters of a mile from the aerodrome the pilot carried out a manœuvre which caused the aeroplane to stall and nose-dive to the ground. Fire occurred on impact and all the occupants of the machine were killed.

The full report made to the Secretary of State of the Formal Investigation into this accident was duly published.*

2. *Hire Services.*

The only accident in this category was caused by the waterlogged condition of an aerodrome, the machine failing to " unstick" before reaching the boundary hedge.

3. *Short Passenger Flights.*

Column (*a*).—In one case the pilot overshot the landing ground and the aeroplane crashed into a fence.

In the other case the engine stopped owing to lack of petrol in the main tank, shortly after the aeroplane had taken off and an error of judgment on the part of the pilot caused the machine to stall near the ground.

Column (*b*).—A stay tube of the tail plane became detached from the fuselage during flight and in consequence of this the pilot attempted to land on unsuitable ground and the aeroplane turned over. The detachment of the stay tube was attributed to a fatigue fracture of the bottom end fitting.

Column (*c*).—Almost as soon as the aeroplane left the ground the engine failed completely and the pilot, in order to avoid landing amongst spectators, was obliged to make a turn at a very low height. During this turn the aeroplane lost flying speed and side-slipped to the ground. The failure of the engine was due to a defective magneto.

Column (*d*).—While flying through a bank of mist the aeroplane struck some telegraph wires and fell to the ground. The pilot and one of the two passengers were slightly injured.

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* Cmd. 2351/1925, H.M. Stationery Office. Price 3*d*. net.

Column (*e*).—When the pilot was attempting to take off from a small and very rough field, in which a successful forced landing had been made, the aeroplane failed to clear the boundary hedge and was wrecked.

4. *Constructors' Trials.*

Column (*b*).—This accident occurred to a racing seaplane. After the pilot had alighted, at the conclusion of the first test flight, the chassis collapsed, causing the machine to turn over and finally sink. The pilot was rescued unhurt.

In addition to the above record, mention must be made of two serious accidents which occurred to aircraft of military design while undergoing tests at the constructors' works.

(1) An experimental type of aeroplane, when starting on its first flight, stalled at a low height and nose-dived to the ground. The pilot, who was the only occupant of the machine, was very seriously injured.

(2) While a foreign military pilot was performing aerobatics on a single seater "fighter" and subjecting the aeroplane to very high stresses, part of the wing structure failed. The aeroplane fell to the ground completely out of control and the pilot was killed.

FOREIGN AIRCRAFT.

Two accidents to foreign aircraft occurred in this country during the period under review and both involved French machines employed on the cross-Channel services. The circumstances were as follows :—

(1) Owing to a complete failure of the engine, which occurred when the aircraft was crossing the Channel, the pilot was forced to alight in the sea off Folkestone. The pilot, who was the only occupant of the aeroplane, was rescued.

(2) The port engine of a two-engined aircraft failed when the machine was flying at a low altitude. The pilot attempted to reach an aerodrome but in doing so he stalled the machine and crashed to the ground. The pilot and mechanic escaped injury.

STATISTICS OF CIVIL FLYING.

Statistical tables of British civil aviation are given on pages 30–35.

Summary.

Table A gives figures for all air transport flying, whether regular or irregular (Part I), and all other flying for hire or reward (Part II). A slight fall in air transport flying occurred as compared with the previous year, mileage having declined from 1,004,000 to 890,000, and passengers carried from 15,013 to 13,478. This fall is explained partly by the loss of flying during the first few months of operation by Imperial Airways, Ltd., partly by the discontinuance of the Southampton–Guernsey service by the same company and partly by the reduction in air transport flying carried out by the De Havilland Hire Service. The carriage of cargo, on the other hand, showed an increase from 427·1 tons to 508 tons, thus illustrating the success of the efforts of Imperial Airways, Ltd., to increase this branch of their business.

Other flying for hire or reward, mainly "joy ride" flying, showed an all-round increase, mileage having risen from 120,000 in the previous year to 139,000 and passengers from 39,227 to 43,766.

A noteworthy point shown by Table A is that from May, 1919, up to 31st March, 1925, 52,552 passengers were carried by British air transport services and 247,773 passengers took flights in other machines in commercial operation. In the same period the total mileage flown in both air transport and other commercial flying amounted to 5,126,000 miles.

Table B relates to flights and passengers carried between Great Britain and the Continent (excluding the Channel Islands) by foreign as well as British aircraft.

The traffic increased as compared with the previous year from 4,665 to 4,832 aircraft flights and from 14,777 to 17,835 passengers carried. The British share of the passenger traffic, however, showed a fall to 58 per cent. from the high level of 79 per cent. reached in the previous year.

Table C indicates, on the basis of value of imports and exports by air, the large increase in cargo carried by air transport services, British and foreign combined. The total value of air-borne imports and exports during the year under review was 1,328,395*l.*, an increase of 445,162*l.* over the previous year's figure of 883,233*l.* The principal part of this increase was contributed by exports to and imports from France, a remarkable proof of the demand that exists for air conveyance on the London–Paris route, well served as it is by ordinary methods of transport that are not subject to abnormal Customs delays.

Table D illustrates the efficiency of the subsidised services. Owing to the change in the system of subsidy upon the inauguration of operations by Imperial Airways, Ltd., the information which formed the basis of Table D in the last report has ceased to be available and the present table is not therefore comparable. The differences are noted at the foot of the table.

The standard of "efficiency" adopted in this year's table is the completion of a stage flight without interruption. It will be seen that out of 4,328 stage flights commenced, 4,064 or 94 per cent. were completed without interruption, and that out of the 264 stage flights interrupted, 105 were completed on the same day after the interruption.

Table E analyses the causes of involuntary landings on regular air services. A total of 286 involuntary landings occurred, excluding landings for refuelling. The causes of these landings were : weather 50 per cent., engine or installation failure 34 per cent., and other causes 16 per cent.

Table F.—Accidents. There was one fatal accident during the year, that which occurred on Christmas Eve, 1924, when seven passengers were killed. From May, 1919, up to 31st March, 1925, the number of accidents involving the death of passengers in air transport flying was 4, and the mileage flown 3,698,000. These figures give the following rate :—

One fatal accident in a distance flown of 924,500 miles, equal to 37 times round the world.

For the third year in succession no fatal accident involving passengers occurred in other flying for hire (mainly " joy ride " flights). One passenger was, however, injured slightly.

TABLE A.

BRITISH CIVIL AVIATION.

(*May, 1919, to March, 1925, inclusive.)

Period.	Part I.				Part II.		
	Air Transport (Internal and Continental).				Other Flying.†		
	Machine Flights.	Machine Mileage.	Passengers carried.	Cargo carried.	Machine Flights.	Machine Mileage.	Passengers carried.
				(Tons.)			
April, 1924	36	7,000	36	1·5	1,453	8,000	2,975
May „	328	60,000	530	48·3	1,839	13,000	3,940
June „	562	108,000	1,552	61·2	2,605	16,000	4,932
July „	828	160,000	2,746	80·7	2,425	15,000	4,746
August „	786	144,000	2,936	69·3	5,080	27,000	9,130
September „	600	119,000	2,249	66·4	2,354	12,000	4,466
October „	403	79,000	1,274	41·0	1,624	12,000	3,126
November „	253	47,000	630	34·5	1,448	10,000	2,657
December „	204	37,000	444	28·4	1,080	5,000	1,725
January, 1925	156	29,000	150	16·2	794	5,000	1,351
February „	236	44,000	302	27·3	1,060	6,000	1,821
March „	285	56,000	629	33·2	1,757	10,000	2,897
Total, year ending 31st March, 1925	‡ 4,677	‡ 890,000	‡ 13,478	‡508·0	23,519	139,000	43,766
Total, year ending 31st March, 1924	5,012	1,004,000	15,013	427·1	22,842	120,000	39,227
31st March, 1923	4,000	778,000	11,460	216·4	13,578	109,000	25,253
31st March, 1922	1,156	259,000	5,692	26·6	21,767	234,000	36,048
31st March, 1921	2,641	599,000	5,754	124·5	23,513	302,000	36,694
*31st March, 1920	754	168,000	1,155	46·0	37,067	524,000	66,785
Total: May, 1919, to March, 1925	18,240	3,698,000	52,552	1,348·6	142,286	1,428,000	247,773

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* Air Transport (Part I.) commenced in August, 1919, and Other Flying (Part II.) in May, 1919.

† In Part II. of this table the figures subsequent to March, 1922, refer to flights for hire or reward other than air transport flights; and thus consist almost entirely of joy riding. The figures for the previous three independent periods include all flying other than regular air transport. Based on returns for 1922, about 91 per cent. of the flying shown in Part II. previous to April, 1922, would have been flying for hire or reward.

‡ Imperial Airways, Ltd., contributed to these totals 93 per cent. of the machine flights and mileage, 98 per cent. of the passenger traffic and the whole of the goods traffic.

TABLE B.

AIRCRAFT FLIGHTS AND PASSENGERS CARRIED BETWEEN GREAT BRITAIN AND THE CONTINENT (EXCLUDING CHANNEL ISLANDS).

(August, 1919, to March, 1925, inclusive.)

Period.	Nationality of Aircraft.												Percentage of British to Total.	
	British.		French.		Dutch.		Belgian.		Others.*		Total.			
	Flights.	Passengers carried.	Flights.	Passengers carried.	Flights.	Passengers carried.	Flights.	Passengers carried.	Flights.	Passengers carried.	Flights.	Passengers carried.	Flights. %	Passengers. %
April, 1924	8	8	113	567	45	115	—	—	—	—	166	690	5	1
May ,,	157	464	148	506	57	128	—	—	—	—	362	1,098	43	42
June ,,	319	1,244	171	620	55	155	—	—	24	35	569	2,054	56	60
July ,,	501	2,166	203	1,138	60	263	2	4	27	51	793	3,622	63	60
August ,,	473	2,256	193	1,061	66	275	—	—	27	62	759	3,654	62	62
September ,,	380	1,575	131	575	56	225	2	4	12	19	581	2,398	66	66
October ,,	234	939	111	492	47	124	—	—	19	24	411	1,579	57	59
November ,,	132	489	76	219	36	70	—	—	17	20	261	798	51	61
December ,,	124	362	43	113	27	50	—	—	4	5	198	530	63	68
January, 1925	85	118	43	58	27	23	—	—	8	7	163	206	52	57
February ,,	154	233	52	86	46	64	—	—	—	—	252	383	61	61
March ,,	194	498	71	210	48	106	—	—	4	9	317	823	61	60
Total, year ending 31st March, 1925	2,761	10,352	1,355	5,645	570	1,598	4	8	142	232	4,832	17,835	57	58
Total, year ending—														
31st March, 1924	2,714	11,648	993	2,107	559	991	390	12	9	19	4,665	14,777	58	79
31st March, 1923	2,965	10,066	1,486	2,423	681	679	2	1	3	3	5,137	13,172	58	76
31st March, 1922	1,156	5,692	1,575	4,258	368	483	342	597	53	12	3,494	11,042	33	51
31st March, 1921	2,641	5,754	786	837	3	—	176	128	4	1	3,610	6,720	73	86
31st March, 1920 (7 months)	754	1,155	133	97	—	—	7	3	2	—	896	1,255	84	92
Total: August, 1919, to March, 1925	12,991	44,667	6,328	15,367	2,181	3,751	921	749	213	267	22,634	64,801	57	69

* Note. 1924/5—German.

TABLE C.

VALUE OF GOODS (*a*) IMPORTED INTO THE UNITED KINGDOM BY AIRCRAFT; (*b*) EXPORTED AND RE-EXPORTED FROM THE UNITED KINGDOM BY AIRCRAFT.

(August, 1919, to March, 1925, inclusive.)

Period.	Imports from					Exports and Re-exports to				
	Belgium	France.	Nether-lands.	Other Countries.	Total.	Belgium.	France.	Nether-lands.	Other Countries.	Total.
	£	£	£	£	£	£	£	£	£	£
April, 1924	1	36,636	1,975	2,001	40,613	—	3,708	4,712	22,860	31,280
May ,,	13	108,618	4,052	5,065	117,748	9,881	13,579	2,336	13,730	39,526
June ,,	825	95,576	1,802	9,921	108,124	—	18,228	1,292	9,833	29,353
July ,,	1,415	50,533	4,975	11,749	68,672	347	15,436	2,716	11,302	29,801
August ,,	1,749	52,877	4,122	11,693	70,441	873	113,848	1,881	11,334	127,936
September ,,	2,515	64,495	3,492	6,299	76,801	790	37,532	1,471	9,047	48,840
October ,,	2,475	75,834	2,021	6,984	87,314	365	13,393	1,570	7,427	22,755
November ,,	2,139	56,463	3,690	6,505	68,797	742	26,943	3,322	13,792	44,799
December ,,	1,512	61,875	3,443	9,139	75,969	764	24,285	3,144	7,341	35,534
January, 1925	400	29,116	906	3,348	33,770	1,472	21,804	2,490	991	26,757
February ,,	845	35,347	1,265	4,084	41,541	363	22,912	1,111	3,485	27,871
March ,,	1,003	42,158	2,313	5,840	51,313	423	15,133	1,227	6,057	22,840
Total, year ending 31st March, 1925	14,892	709,528	34,055	82,628	841,103	16,020	326,801	27,272	117,199	487,292
Total, year ending—										
31st March, 1924	2,909	489,378	34,225	78,058	604,570	4,970	182,819	28,371	62,503	278,663
31st March, 1923	3,651	445,488	45,106	3,877	498,122	7,837	225,144	31,373	1,318	265,672
31st March, 1922	4,583	325,417	8,471	560	339,031	3,535	178,759	19,741	948	202,983
31st March, 1921	4,453	665,099	2,178	10,579	682,309	26,570	260,954	44,210	4,297	336,031
31st March, 1920 (seven months)	391	135,248	471	6	136,116	9,583	57,161	—	1	66,745
Total: August, 1919, to March, 1925	30,879	2,770,158	124,506	175,708	3,101,251	68,515	1,231,638	150,967	186,266	1,637,386

TABLE D.

EFFICIENCY OF BRITISH SUBSIDISED AIR SERVICES.

Month		Flights over Single Stages.				Percentage completed uninterrupted.
		Total commenced.	Completed same day uninterrupted.	Completed same day after interruption.	Not completed same day.	
						Per cent.
April,	1924	6	6	—	—	100
May,	,,	213	207	6	—	97
June,	,,	515	496	13	6	96
July,	,,	778	748	15	15	97
August,	,,	762	730	20	12	96
September,	,,	568	543	11	14	96
October,	,,	371	343	17	11	92
November,	,,	252	222	4	26	88
December,	,,	203	168	9	26	83
January,	1925	153	140	—	13	92
February,	,,	229	204	4	21	89
March,	,,	278	257	6	15	92
Total		4,328	4,064	105	159	94

NOTE.—The above table differs from Table D given in the report for 1923–4 as the basis of subsidy payments has been changed. Last year's table related to flights commenced on scheduled services only, intermediate stage flights and special trips being omitted, whereas the above table relates to *all* stage flights commenced. Further, the classification of flights as "completed within subsidy time," which was employed in last year's table, is no longer used—and landings for petrol or oil are not included as interruptions.

TABLE E.

*CAUSES OF INVOLUNTARY LANDINGS IN RESPECT OF FLIGHTS BY BRITISH SUBSIDISED AIR SERVICES.

Period.	Total flights commenced.	Cause of landing.				Percentage of total landings.			Percentage of total flights commenced interrupted, all causes.
		Weather.	Engine or installation failure.	Other reasons.	Total.	Weather.	Engine or installation failure.	Other reasons.	
April, 1924, to September, 1924 -	2,842	36	60	20	116	Per cent. 31	Per cent. 52	Per cent. 17	Per cent. 4
October, 1924, to March, 1925 - -	1,486	108	36	26	170	64	21	15	11
Total (12 months): April, 1924 to March, 1925.	4,328	144	96	46	286	50	34	16	7

* Landings for petrol or oil are not included.

NOTE.—To facilitate cross-reference between Tables D. and E., the basis of compilation of Table E. differs from that adopted in the report for 1923-4, and the results for previous years are not therefore comparable.

It should be noted also that Table D. accounts for 264 interrupted flights, whereas Table E. gives the causes of 286 interruptions: this difference is due to the fact that on 22 stage flights there were two interruptions.

TABLE F.

ACCIDENTS : CIVIL AVIATION.

(May, 1919, to March, 1925, inclusive.)

——	May, 1919, to March, 1920.		April, 1920, to March, 1921.		April, 1921, to March, 1922.		April, 1922, to March, 1923.		April, 1923, to March, 1924.		April, 1924, to March, 1925.	
	Air Transport.	Other Flying.	Air Transport.	Other Flying.	Air Transport.	Other Flying.	Air Transport.	Other Flying for Hire.	Air Transport.	Other Flying for Hire.	Air Transport.	Other Flying for Hire.
Passengers killed	1	—	2	7	No Accidents	1	—	No accidents resulting in death or injury.	3	—	7	—
Passengers injured	2	9	2	1	,,	2	1		—	—	—	1
*Passenger flights per passenger killed	1,155	—	2,877	5,242	,,	37,408	—		5,004	—	1,925	—
*Passenger flights per passenger injured	580	7,420	2,877	36,694	,,	18,704	11,460		—	—	None injured	43,836
Crew killed	2	2	2	3	,,	2	2		2	—	1	—
Crew injured	1	9	—	6	,,	4	1		3	1	—	1
No. of accidents involving casualties:—												
Fatal	2	2	1	3	,,	2	1	No accidents resulting in death or injury.	1	—	1	—
Non-fatal, but resulting in injury to occupants	—	11	1	6	,,	4	1		2	1	—	1
*Approximate machine miles per accident resulting in death or injury to occupants	84,000	40,000	299,000	34,000	,,	39,000	389,000		335,000	120,000	890,000	139,000
*Machine flights per accident resulting in death or injury to occupants	377	2,851	1,320	2,612	,,	3,628	2,000		1,671	22,800	4,677	23,519

NOTE :—The numbers of crew carried are not available. For details of accidents during 12 months April, 1924, to March, 1925, *vide* pages 25–27.

* For the period May, 1919, to March, 1922, other flying includes all flying other than air transport or competitive flying.
For the period April, 1922, to March, 1925, other flying is flying for hire or reward other than air transport or competitive flying.

THE DOMINIONS, INDIA AND THE COLONIES.

AUSTRALIA.

The air transport services to which reference has been made in previous reports are being maintained with increasingly good results and are being extended. The following particulars and the table on page 38 indicate the useful work being done on these routes.

Perth–Derby (1,442 miles).

This service, operated by the Western Australian Airways, Limited, has now entered its third year of operation. In 1924, the mail traffic showed an increase of 50 per cent. on the previous year and passenger traffic increased by 25 per cent.

Approval has been given for an extension of the route from Derby to Wyndham, thus increasing the length of the line to rather more than 2,000 miles. The provision of landing grounds on this sector is expected to be completed by July, 1925.

The annual subsidy paid to this company is 30,000*l.* (subject to revision annually).

Charleville–Cloncurry–Camooweal (825 miles).

The Charleville–Cloncurry route (577 miles) has been operated by the Queensland and Northern Territory Aerial Services, Limited, since 11th November, 1922. An extension from Cloncurry to Camooweal (248 miles) has been running since 7th February, 1925. Camooweal is the gateway to the rich pastoral district in the Northern Territory and the extended route serves also the new mining district of Mt. Isa.

The passenger traffic in 1924 showed an increase of 66 per cent. over 1923, and following a reduction of fares in December, 1924, and the opening of the extension to Camooweal in February, 1925, the passenger bookings have been further substantially increased.

The annual subsidy for the extended service is 17,000*l.*

Adelaide–Sydney (790 miles).

After considerable delay in obtaining machines, this service was opened by the Larkin Aircraft Supply Coy, Limited, on 2nd June, 1924, using machines intended as reserves. Three D.H. 50 aeroplanes were delivered to the company in November, 1924, and immediately placed in service.

Although an excellent record of reliability has been attained, traffic over the route has not been considerable owing to the fact that a good night train service connects the two capitals. Arrangements are therefore in hand to modify and extend the air line.

The proposal is that the air service will be run between Adelaide and Cootamundra (N.S.W.) (580 miles), and between Cootamundra and Sydney the existing railway facilities will be utilised. At the same time, branch lines will be opened between

Mildura and Broken Hill (186 miles) and between Hay and Melbourne (233 miles).

Broken Hill, a city of 30,000 inhabitants, is one of the largest inland cities of the Commonwealth and is at present provided with relatively slow means of communication with the chief capital cities—Sydney and Melbourne. The journey of 69 hours by train from Sydney to Broken Hill will be reduced to 19 hours by the air service, which is expected to begin in July, 1925.

During 1924, not a single fatal accident or injury to a passenger occurred in the course of the regular air transport flying on the subsidised routes. A total distance of 262,895 miles was flown and 1,200 passengers, 11,345 lbs. of goods and 208,040 letters were carried. Detailed statistics of the traffic are given in tabular form on the following page.

Two flights round Australia were made in the course of the year. The first by Wing Commander S. J. Goble and Flying Officer MacIntyre was made with a view to selecting aircraft bases and also in order to test the stowage arrangements which were being prepared in H.M.A.S. "Geranium" to enable her to carry aircraft during the forthcoming hydrographic survey of the Great Barrier Reef, in which aerial photography will be employed. It was carried out on a Fairey III.D seaplane (360 h.p. Rolls-Royce "Eagle VIII" engine). Leaving Melbourne on 6th April, the machine arrived back at the port of departure on 19th May, having travelled roughly 9,000 miles at an average speed of 90 miles an hour. This flight ranks as an outstanding achievement in aviation during 1924 because no special organisation had been laid down beforehand and for a large part of the journey no facilities or aid could be expected in handling and maintaining the seaplane. The Britannia Trophy for 1924 was awarded to the two officers engaged, their flight being selected as the most meritorious performance in British aviation during the year.

The second flight was carried out by Colonel Brinsmead, Controller of Civil Aviation, Captain E. J. Jones, Superintendent of Flying Operations and Mr. Buchanan, a Civil Aircraft Inspector. The purpose of this journey was to inspect routes which had been or were being prepared, and to survey the route lying between Port Darwin and Camooweal on the one hand and Port Darwin and Wyndham on the other hand. The machine used was a D.H.50 (240 H.P. Siddeley "Puma" engine). This flight also commenced and finished at Melborne, and it lasted from 7th-29th August. The flying time was 76¾ hours, distance covered 7,658 miles, and the machine was in the air on 22 consecutive days. As a result of this flight the departmental work involved was accomplished in three weeks as against at least five months if alternative methods of transport had been employed.

A Light Aeroplane Competition was held at the Clarendon Aerodrome, Richmond, New South Wales, from 29th November-6th December last, under the control of the N.S.W. section of the Australian Aero Club. Prizes to the value of 1,300*l*. were offered.

AUSTRALIAN REGULAR AIR SERVICES, 1924.

Service and Period.	Number of Flights.	Miles Flown.	Hours Flown.	Passengers carried over single stages.	Letters carried.	Goods carried.	Remarks.
Perth—Derby 1/1/24–31/12/24.	865 †(2,191)	153,632 (388,717)	2,075 (5,063)	774 (1,675)	194,060 (397,730)	Lbs. 6,460 (14,218)	† Figures in brackets are figures since inception of Service 5/12/21–31/12/24.
Charleville—Cloncurry. 1/1/24–31/12/24.	624 *(1,387)	60,551 (132,102)	786 (1,753)	698 (1,191)	11,700 (26,700)	4,825 (8,856)	* Figures in brackets are figures since inception of Service 2/11/22–31/12/24.
Adelaide—Sydney. 2/6/24–31/12/24.	364	48,712	611	‡	2,360	60	‡ No passengers carried during this period. Service opened for passenger traffic as from 1/1/25.
Total, 1924 -	1,853	262,895	3,472	1,472	208,120	11,345	
Grand Total	(3,942)	(569,531)	(7,427)	(2,866)	(426,790)	(23,134)	

Four machines competed, all of which were privately owned, and were designed and built in Australia. One of these machines was fitted with an Australian-built engine. The principal prize and several other prizes were secured by a machine of bi-plane construction and fitted with an A.B.C. "Scorpion" engine, entered by Mr. D. Macarthur Onslow.

CANADA.

In Canada, there has been distinct and encouraging progress in civil flying during 1924.

The use of aircraft for forest fire protection and the preparation of forest inventories is now well established in many parts of the country. Their usefulness is greatest in the more remote forest areas, where population is sparse and the ground forces cannot be fully organised under present conditions. In such localities aircraft patrols for forest fire detection and suppression are now accepted as being the most efficient method of controlling the fire hazard. It is recognised, however, that forest protection must ultimately be on an economic basis. At present, the principal obstacle to the extension of forest fire protection by aircraft is the high cost of flying; and, until the development of aeronautics enables efficient aircraft to be produced at a lower first and operating cost, the forest authorities hesitate to extend the system. In the meantime, the higher cost for fire protection by air is amply justified when the maintenance of highly organised ground forces would not be possible and the alternative to protection by air is, at best, an imperfect system of canoe patrols.

An outstanding event of 1924 was the decision of the Provincial Government of Ontario, in the spring of the year, to establish their own flying service as part of their Forestry Branch, instead of continuing, as in the past two years, to make contracts with commercial aviation firms for the flying required by their forest services. This decision was taken after four years' trial of the use of aircraft and proves that the Provincial Government is satisfied that flying can play an exceedingly useful, if not essential, part in a modern programme of forest conservation.

Another outstanding feature of the year's work was the establishment of the first air route for the regular conveyance of passengers, mail and freight. This was undertaken by the Laurentide Air Service to serve the new gold field at Rouyn in north-western Quebec. If this new venture is successful, it will mean much to the future of aviation in the country, as there are many localities in which similar services could be operated with every prospect of equal results.

A third feature of the year has been the very remarkable advance in the practical application on a large scale of aerial photography to surveying, exploration and map production, and in addition, to railway location and other engineering problems. Though much remains to be done before the production of maps from aerial photographs, correct in horizontal and vertical scales, is practicable, yet a very large field exists to-day in Canada, in map revision and exploratory mapping, for the practical application of those partial solutions of the problem which are now available. An area of well over 40,000 square miles was covered in 1924 by oblique and vertical pictures for the Topographical Survey Branch of the Department of the Interior, and it is not too much to say that aerial photography has already revolutionised their system of map production in many respects. The production of accurate topographical maps to keep pace with the growing demand for land settlement, lumbering operations, and many other activities, is a difficult problem. The new method is of great benefit as it will enable the Survey Services to increase their output and lessen the ground work in the field, thus enabling each party to cover a larger area in the season.

The oblique method of photography is still largely used, because by this method it is possible to cover a much larger area of country in one photograph. Vertical photographs, however, have been taken for revision work. Among the survey operations carried out were oblique photography of a large part of the Churchill River and the whole of Reindeer Lake, an area of approximately 15,000 square miles, completed in about 44 hours flying; oblique photography of an area of 6,300 square miles in the neighbourhood of Edmonton; oblique photography of two areas totalling 7,600 square miles east of Lake Winnipeg; vertical photography of 3,500 square miles of territory, including the cities of Edmonton and Calgary and the Wainwright National Park.

The mapping field is of interest principally to the Government Service; but in commercial work there is also a great outlet for aerial photography, and energetic steps are being taken to develop this by commercial operators. Photographic mosaics are much in demand for town-planning purposes, preliminary surveys of railroad and power transmission lines, and the development of water-power projects. As the existing maps of very large areas in Canada are admittedly imperfect and in many cases non-existent, the engineer turns naturally to a method which gives, on short notice, a picture showing in the greatest detail all the natural and artificial features of the ground, even though it may contain small discrepancies in regard to scale.

The Fairchild Aerial Surveys Company (of Canada), Limited, carried out one survey of 2,500 square miles of forest country, besides many smaller areas. The Laurentide Air Services, Limited, and the Dominion Aerial Exploration Company, Limited, also carried out photographic work.

A tabular statement of the civil flying in Canada in 1924 is given on the next page.

In the technical development of aircraft and equipment also, there is sound progress to report. Experience has shown the

CIVIL AVIATION IN CANADA, 1924.

Name.	Amount of flying.			Principal work, in hours.				
	Flights.	Hours flown.	Miles flown, Approx.	Forest fire patrols.	Reconnaissance, sketching and photography.	Transport.	Instructiom and Test.	Miscellaneous.
Ontario Provincial Government -	1,325	2,595	170,000	1,547	410	85	66	—
Dominion Exploration Co., Ltd.	240	346	24,000	140	206	—	—	—
Fairchild Aerial Survey Co. (of Canada), Ltd.	138	232	17,000	—	232	—	—	—
Laurentide Air Services, Ltd. -	894	933	66,000	—	182	512	12	220
Other civil operators - - -	1,179	382	17,778	Passenger carrying and pleasure flying.				
TOTAL : All civil operators -	3,776	4,488	294,778	1,687	1,030	597	78	220
Royal Canadain Air Force—Civil operations.	1,289	2,471	163,988	1,366	508	—	—	756

lines of most practical development, and work is proceeding on the design and production of new types to meet the particular conditions existing in Canada.

During the year, Canadian Vickers, Limited, produced from their own designs, at their aircraft factory in Montreal, the first post-war Canadian-designed and built aircraft. This is a small three-seater flying boat built to R.C.A.F. specifications. The trials showed that this new aircraft not only comes up to specification, but gives promise of further development into an exceedingly useful new type.

The Canadian "Report on Civil Aviation, 1924," issued by the Canadian Department of National Defence (price 25 cents net) gives full information on the very interesting work accomplished up to the end of 1924.

SOUTH AFRICA.

At a meeting of the Civil Air Board held on 6th and 9th November, 1923, the inauguration of a three months' experimental air mail service between Pretoria and Capetown by the Union Air Force was recommended; but, for financial reasons the Government were unable to adopt this proposal. A suggestion for a three months' experimental service between Cape Town and Durban, made as the result of a second meeting held on 28th October, 1924, was, however, accepted. This route, which covers a distance of approximately 950 miles, offers greater advantages to the public than the Pretoria–Cape Town route, as, under the ordinary mail service, Durban, unlike other large centres in South Africa, cannot reply to its European letters by return boat. Under the old methods of transport, replies from Durban cannot leave South Africa until 11 days after the arrival of the incoming mail; but, by using the air mail, replies can be despatched the same week, thus effecting a clear saving of seven days.

The service was inaugurated by the Union Air Force on 2nd March, 1925, and runs weekly in each direction in connection with the European mails.

If, at the expiration of the experimental period of three months, the results justify this course, the Government will assist, by means of subsidies, the development of the route by private enterprise.

NEW ZEALAND.

In addition to the training flying done by the officers of the New Zealand Air Force at the Wigram Aerodrome, Sockburn, the services of these officers are coming more and more into request for civil flying for pleasure and commercial purposes. During 1924, the total number of civil flights made was 355, carrying 635 passengers. The aggregate flying time amounted to just over 84 hours, while the total number of miles flown was 6,352.

INDIA.

As already mentioned earlier in the report, representatives of the Air Ministry visited India at the end of 1924, and made a thorough examination of possible airship bases at Karachi, Bombay, Madras, Calcutta, Delhi and Colombo. As a result, the Standing Finance Committee of the Indian Legislative Assembly have recommended that a site at Karachi should be leased rent-free to the British Government, and that a grant-in-aid should be made equal to the import duties on the materials to be employed in the construction of an airship base.

Whilst engaged in his visit to India, Air Vice-Marshal Sir W. Sefton Brancker, K.C.B., A.F.C., Director of Civil Aviation, carried out considerable educative work by means of talks on the advantages of air transport services delivered to Chambers of Commerce and other commercial bodies. At the same time, he investigated the needs of the commercial community and the possibilities of establishing services.

Air survey of the forests of Burma continues. The aerial photography is carried out by the Air Survey Company, Limited, which was registered in London on 27th October, 1924, and is carrying on the business formerly conducted by Mr. R. C. Kemp at Rangoon and elsewhere.

BRITISH GUIANA.

A seaplane has been obtained by a Balata Estate on the Rupununi River for the purpose of conveying fever patients from up-country plantations and mining camps to Georgetown Hospital. A journey which formerly occupied from 17 to 21 days and frequently proved fatal to the patient will now be made by air in two hours. The machine is specially fitted as an ambulance and was supplied by the Fairey Aviation Company, Limited.

A scheme for the establishment of an air line from Georgetown to the diamond mines on the Mazaruni River has been submitted to the Government of British Guiana by the West Indian Aerial Transport Company, Limited.

PART II.—FOREIGN COUNTRIES.

EUROPE.

The accompanying plate shows the air lines of Europe, N. Africa and the Middle East in 1925.

ALBANIA.

The Adria Aero Lloyd has been founded in Albania under German management. The company has entered into an agreement with the Government of Albania and has been granted, for ten years, the exclusive right of operating air mail, passenger and freight services over such routes as it is able to serve. The company has contracted to maintain, during the first year, a service between the towns of Scutari, Tirana, Valona and Kortcha.

BALTIC STATES.

An air service on the line Helsingfors–Reval was opened on 29th June, 1923, by the Esthonian company "Aeronaut" which subsequently became a member of the German "Nord-Europa Union" and continued to operate the same route as part of the main Nord-Europa line Konigsberg–Helsingfors. From March, 1924, the traffic on the Helsingfors–Reval section was partly taken over by the Finnish company "Aero O/Y," which was founded at the end of 1923 and, like the Esthonian company, later joined the Nord-Europa Union. From February to September, 1924, 1,005 passengers were carried.

A trial air service between Helsingfors and Stockholm was opened on 1st June, 1924, by the Finnish "Aero O/Y" in conjunction with the Swedish company "Aerotransport A.B." This service received considerable and increasing public support, but owing to insufficient subsidy it had to be discontinued on 23rd August, 1924; 334 passengers were carried.

BELGIUM.

The financial vote for civil aviation for 1924 amounted to 5,792,590 francs, as compared with 6,795,000 francs in 1923. The S.A.B.E.N.A. (Societe Anonyme Belge d'Exploitation de la Navigation Aeriénne) opened a service from Rotterdam to Strasburg *viâ* Brussels on 2nd April, 1924, at first for the carriage of goods only. In June, the service was extended to Basle, and passengers and mail were also carried.

The service was further extended, to Amsterdam, in September, 1924, and the landings at Strasburg were suspended in November. Traffic on this line was suspended for the winter from 15th December, 1924, until 1st April, 1925.

Work is well advanced on the proposed service in the Belgian Congo from Kinshasa to Katanga. The total distance is 1,860 km., and the first section, from Kinshasa to Luebo, is practically ready to put in operation. Eight Handley-Page 3-engined machines are to be used, one of which is to go by air from Belgium to the Belgian Congo. The machines are being constructed under licence by a Belgian firm, the Societe Anonyme Belge de Constructions Aeronautiques.

CZECHOSLOVAKIA.

An air service Prague–Bratislava–Kosice has been operated by the Czechoslovak Government since the beginning of 1924. During the first 11 months' working 426 passengers, nearly two tons of goods and 354 lbs. of mails were carried, and 634 flights, covering a distance of about 126,400 miles, were carried out. No accident resulting in damage to machines or injury to occupants occurred. It is hoped to extend the service to Uzhorod.

A national air transport company is in process of formation in Czechoslovakia and will take over the development of civil air routes. The State is to subsidise the company and will eventually take a part of the shares.

An agreement between Czechoslovakia and Germany relating to the operation of air services between the two countries is under consideration, and negotiations have begun regarding a further agreement between Czechoslovakia and France.

(The participation of British aircraft constructors in the Prague Aeronautical Exhibition is referred to on page 14).

DENMARK.

The Copenhagen–Rotterdam service was reopened by the Danske Luftfartselskab on 23rd April, 1924, in conjunction with the Deutscher Aero Lloyd (Germany) and the K.L.M. (Holland). It was operated until 6th October, when the Danish subsidy came to an end. Up to the end of August over 1,000 passengers were conveyed in the company's machines, compared with 414 for the whole of the season of 1923.

Early in 1925 a new company was formed in Denmark under the title of Dansk Lufttransport, with a capital of 250,000 kroner, a portion of which was subscribed by the German Junkers company.

On the initiative of the Ministry of Public Works an amalgamation between the old and the new Danish companies was proposed in March, 1925, and a State subsidy of 250,000 kroner yearly for a period of four years was promised to the joint company. Owing to differences between the two companies, however, the amalgamation was abandoned.

The Danish Government subsequently decided to grant the whole of the said subsidy to the Danske Luftfartselskab, as a contribution towards Denmark's participation in the air routes Copenhagen–Hamburg, Copenhagen–Berlin and Copenhagen–Hamburg–Amsterdam. The amount of the subsidy may be increased as a result of negotiations which are proceeding between the Danish Government and the Copenhagen Municipality with a view to obtaining from the latter body a yearly grant of 100,000 kroner, for a period of four years, towards the maintenance of air routes touching at Copenhagen.

An air traffic agreement has been concluded between Denmark and Poland, and the question of a service between Copenhagen and Dantzig to be operated by a Polish company is under consideration. (*See under* Poland).

FRANCE.

The financial vote for civil aviation for 1924 was identical with the vote for 1923, *i.e.*, 138,463,350 francs.

The vote for 1925 is expected to amount to 154,565,715 francs, of which 57,335,000 francs are to be allocated for subsidies, as compared with 46,922,000 francs for 1924.

The Compagnie Franco-Roumaine obtained the consent of the Turkish Government for a temporary extension of their Paris-Bucharest service to Constantinople and in addition obtained a concession for a trial service on to Angora. The service to Constantinople was commenced at the beginning of April, 1924, and early in September a three-months' trial mail service from Constantinople to Angora was started. A regular night service was carried out experimentally on the section of this company's line from Belgrade to Bucharest. As in previous years, the Cie Franco-Roumaine also operated a service from Paris to Warsaw. On 15th November, 1924, the company followed its usual practice of closing all its services until the following February.

The capital of the Cie. Franco-Roumaine has been reduced from 10 million francs to 8¼ millions, and from 1st January, 1925, the name of the company has been changed to "Compagnie Internationale de Navigation Aerienne" (C.I.D.N.A.).

The company is experiencing considerable difficulty owing to the absence of an agreement with the German Government to permit the passage of French aircraft over Germany. To avoid crossing German territory the company has decided to dispatch its machines *viâ* Zurich and Innsbruck to Vienna and Prague instead of *viâ* Strasburg and South Germany. The new route however, crosses a belt of mountainous country very unfavourable for regular air transport flying.

Developments have taken place with regard to the service from France to S. America projected by the Compagnie Generale d'Entreprises Aeronautiques (Latecoere). The scheme is as follows :—

(i) The continuation of the present line Toulouse–Casablanca to Dakar by aeroplane.

(ii) From Dakar to Fernando do Noronha Island (Brazil) by fast steamer.

(iii) From Fernando do Noronha Island to Rio de Janeiro and Buenos Aires by aeroplane.

The extension to Dakar from Casablanca will be operated in 1925, and the company has at present in S. America a mission which has begun negotiations with Brazil, the Argentine and Uruguay for the establishment of that end of the line.

The mail traffic on the Toulouse–Casablanca service still continues to increase rapidly and the weight of letters carried in 1924 was approximately 483 tons, being an increase of 327 tons over the amount carried in 1923. This was exclusive of approximately 33½ tons carried on the three other branch lines of the company, *i.e.*, Casablanca–Oran, Marseilles–Perpignan and Alicante–Oran.

Apart from the air lines already referred to, the following other lines were operated by French companies :—

Paris–London - -	Air Union.
Paris–Amsterdam - -	Société Generale de Transports Aeriens.
Antibes–Ajaccio - -	Cie. Aeronavale.

The following table shows the increase in French air traffic during the last three years :—

	1922.	1923.	1924.
Miles flown (approx.) - -	2,015,000	2,115,000	2,249,000
Passengers carried - -	6,722	7,811	16,277
Goods and mail carried (approx.) tons - -	396	778	1,515

The world's records for speed, duration and altitude were regained by France during the latter half of 1924. Substantial prizes were offered by the French Government to encourage French constructors to recover the principal world's records. Similar prizes are to be offered in 1925.

Between 24th April and 9th June, 1924, Lt. Pelletier D'Oisy carried out a flight from Paris to Tokio, 11,500 miles, divided into 20 stages, averaging 575 miles in length. His first stage from Paris to Bucharest, 1,240 miles, was flown without a stop, and he reached Karachi in six days' flying, averaging nearly 700 miles a day.

The elementary training of pilots is carried out at eleven schools which are located in different parts of the country. These schools are conducted on a civilian basis, but are State-aided and under State control. They are open not only to youths, who intend to serve in the Military or Naval Air Services, but also to any individual who wishes to learn to fly. At six of the schools refresher courses are given to trained pilots who have returned to civil life and desire to keep up their proficiency in flying.

GERMANY.

The sum allocated to "air traffic" in 1924 in the votes of the Ministry of Transport was as follows :—

	Marks.	£ (approx.)
(1) Contribution towards public air services	4,900,000	245,000
(2) For scientific and general purposes -	2,950,000	147,500
(3) For exhibitions and competitions -	1,129,000	56,450
(4) For gliding machines and light aeroplanes - - - - - - -	750,000	37,500
(5) Contribution towards permanent air traffic structures - - - -	500,000	25,000
(6) For air traffic Wireless Stations -	80,000	4,000
(7) For Meteorological Stations - -	82,800	4,140
(8) Contribution towards cost of Kite Observation Port at Friedrichschafen	9,200	460
(9) Contribution towards cost of Aircraft Experimental Station at Adlershof -	50,000	2,500
(10) Contribution towards cost of Aerodynamical Laboratory at Gottingen -	3,000	150
(11) Contribution towards cost of Aircraft Museum at Adlershof -	3,500	165
Marks	10,457,500	£522,875

It will be seen that no less than 486,450*l.* (items 1 to 4) was devoted to direct assistance to civil aviation.

Air transport subsidies (item 1) are paid on a kilometric basis, the amount varying according to the nature of the route. The average subsidy is reported to be in the neighbourhood of 1·50 mks. per km. flown (= 2*s.* 5*d.* per mile).

Remarkable interest in air transport is being shown by provincial and municipal authorities and local commercial interests, with the result that the German Government is again giving its support to comparatively short internal air lines. In 1923, the subsidies to internal lines were withdrawn, and attention was concentrated on routes radiating to foreign countries. The present policy, however, is directed to arousing the utmost interest in air transport throughout the country, and subsidies appear to be given to every air line for which capital can be raised.

As in previous years, the operations are almost entirely in the hands of the Deutscher Aero Lloyd A.G. and the Junkers Company. These two groups have been very considerably enlarged. They are now constituted as shown below, new companies formed during the year under review being indicated by an asterisk :—

Deutscher Aero Lloyd Group.

Deutscher Aero Lloyd A.G.

Subsidiary and Associated Companies :—

Deutsche-Russische Luftverkehrs A.G., Moscow. ("Deruluft.")
Danziger Aero Lloyd A.G.
*Chemnitzer Lufthafen G.m.b.H., Chemnitz. (Capital, 500,000 mks.)
*Mitteldeutsche Aero Lloyd A.G., Leipzig. (Capital, 140,000 mks.)
*Suddeutsche Aero Lloyd A.G., Munich. (Capital, 750,000 mks.)
*Wurttemburgische Luftverkehrs A.G., Stuttgart. (Capital, 700,000 mks.)
*Badische Luftverkehrs A.G., Karlsruhe. (Capital, 350,000 mks.)
*Badische - Pfalzische Luftverkehrs A.G., Mannheim. (Capital, 100,000 mks.)
*Dortmunder Luftverkehr A.G., Dortmund.

Junkers Group.

*Junkers Luftverkehr A.G. (Air Transport Branch of Junkers Flugzeugwerke A.G. Capital, 2,000,000 mks.)

Subsidiary and Associated Companies :—

Rumpler Luftverkehrs A.G., Munich.
Bayerische Luft Lloyd, Munich.
Oesterreichische Luftverkehrs A.G., Vienna.
Ungarische Aero Express A.G., Budapest.
Ad Astra A.G., Zurich.
Aeronaut A.G., Reval.
Aero O/Y, Helsingfors.
Aero-Lat A.G., Riga.
*Sachsische Luftverkehrs A.G., Dresden. (Capital, 750,000 mks.)
*Westflug G.m.b.H., Oeynhausen. (Capital, 82,000 mks.)
*Sudwestdeutsche Luftverkehrs A.G., Frankfurt a/M. (Capital, 400,000 mks.)
*Oberschlesische Luftverkehrs A.G., Gleiwitz.
*Schlesische Luftverkehrs A.G., Breslau. (Capital, 400,000 mks.)
*Flugverkehr Halle A.G., Halle. (Nominal initial capital, 160,000 mks.)
*Luftverkehrs Gesellschaft Ruhrgebiet, Essen. (Capital, 2,500,000 mks.)
*Bremer Luftverkehrs Gesellschaft, Bremen.
*Dansk-Lufttransport Aktieselskab, Copenhagen.

In addition, there are a number of independent companies which, up to the present time, have not associated themselves with one or other of the above groups, namely :—

Independent Companies.

Dietrich–Gobiet Luftverkehrs G.m.b.H., Cassel. (Capital, 1,000,000 mks.)

*Aero-Express Luftbetriebs Gesellschaft m.b.H., Leipzig. (Capital, 5,000 mks.)

*Magdeburg Luftreederei, Magdeburg.

*Hessische Flugbetriebgesellschaft, Darmstadt.

*Ostsee Flug Gesellschaft, Travemunde. (Capital, 100,000 mks.)

*Saarbrückener Luftverkehrs Gesellschaft A.G., Saarbrucken.

The Junkers Company is endeavouring to combine all the companies with which it is associated into an organisation entitled the " Europa Union," into which would be merged the existing " Trans-Europa " and " Nord-Europa " unions already formed by the Junkers Company. The central feature of this scheme is the use of standardised machines of Junkers construction, with a uniform system of maintenance and a central repair station. The Junkers Company would contract to keep the machines in repair and replace any damaged. Generally speaking, the technical management would be the responsibility of the Junkers Company and the local commercial management that of the member company. It is intended to secure, if possible, a capital of ten million marks (500,000*l.*) for the Union.

The large increase in air transport during 1924 is illustrated by the following lists of services. New or extended services are indicated by an asterisk :—

Day Services : Summer of 1924.

Route.	Operating Company.
(1) London–Amsterdam–Hanover–Berlin.	Deutscher Aero Lloyd in conjunction with Imperial Airways.
(2) Berlin–Danzig–Konigsberg -	Deutscher Aero Lloyd.
(3) Konigsberg–Moscow - -	" Deruluft " (Deutscher Aero Lloyd).
(4)*Rotterdam – Bremen – Hamburg–Copenhagen–Malmo -	Deutscher Aero Lloyd in conjunction with K.L.M. and Danske Luftfartselskab.
(5)*Hanover–Hamburg - -	Deutscher Aero Lloyd. (Operated in connection with route (1).)
(6)*Hanover–Bremen - - -	
(7)*Marienburg–Danzig - -	Deutscher Aero Lloyd.
(8)*Berlin–Swinemunde - -	Deutscher Aero Lloyd.

Route.	Operating Company.
(9) Geneva – Zurich – Munich – Vienna–Budapest.	Junkers (Trans - Europa Union).
(10)*Munich–Furth–Frankfurt a/M.	Junkers (Trans - Europa Union).
(11)*Berlin–Dresden–Furth - -	Junkers (Trans - Europa Union).
(12) Konigsberg – Memel – Riga – Reval–Helsingfors.	Junkers (Nord - Europa Union).
(13)*Berlin–Leipzig, Dresden–Leipzig, and Frankfurt a/M. – Leipzig.	Junkers Luftverkehr A.G. (with additional service on the Berlin–Leipzig route by Deutscher Aero Lloyd during the Leipzig Fairs.)
(14)*Berlin–Warnemunde - -	Junkers Luftverkehr A.G.
(15)*Bremen–Wangerooge - -	Bremer Luftverkehrs A.G.
(16)*Travemunde to various neighbouring seaside resorts.	Caspar-Werke.

Winter Services, 1924/5.

During the winter 1924/5 an attempt was made for the first time to run regular winter services in Germany. The following routes were maintained :—

Route.	Operating Company.
(1) Frankfurt a/M.–Munich–Vienna–Budapest.	Trans-Europa Union.
(2) Berlin–Danzig–Konigsberg -	Deutscher Aero Lloyd.
(3) Berlin–Leipzig - - -	Junkers Luftverkehr A.G. and Mitteldeutscher Aero Lloyd.
(4) Berlin–Dresden - - -	Trans-Europa Union.

Experimental Night Services, 1924.

(1) *Berlin–Warnemunde–Stockholm.*—An experimental night air mail service over this route was carried out by Junkers Luftverkehr A.G. during August and September, 1924. During the operation of this service an effort was made to maintain a through air mail connection between Stockholm and Zurich and between Stockholm and Budapest.

(2) *Berlin–Stettin–Copenhagen.* The Deutscher Aero Lloyd carried out an experimental night air mail service over this route between 19th September and the end of October, 1924—land planes being used for the Berlin–Stettin section and seaplanes for the remainder of the route.

A further large increase in the air line system is proposed for 1925. Among the many developments under discussion, the following additional or extended services have been reported as definitely decided upon for operation during the year, so far as circumstances permit :—

Additional or Extended Services proposed for 1925.

Route.	Operating Company.
(1) Berlin–Copenhagen–Malmo	Deutscher Aero Lloyd (in conjunction with Danske Luftfartselskab.).
(2) Berlin – Leipzig – Munich – Innsbruck.	Deutscher Aero Lloyd.
(3) Berlin–Leipzig–Stuttgart	” ”
(4) Hamburg – Bremen – Dortmund – Frankfurt – Mannheim–Stuttgart–Zurich.	” ”
(5) Munich – Stuttgart – Baden Baden.	” ”
(6) Danzig–Visby–Stockholm	” ”
(7) Bremen–Hanover–Leipzig–Chemnitz.	” ”
(8) Berlin–Stettin (Night service)	” ”
(9) Berlin–Copenhagen–Malmo	Junkers (Europa Union).
(10) Berlin – Warnemunde – Karlshamn–Stockholm. (Night Service).	
(11) Berlin–Stettin	” ”
(12) Berlin–Breslau–Gleiwitz	” ”
(13) Berlin – Leipzig – Erfurt – Frankfurt.	” ”
(14) Hamburg – Bremen – Dorsten – Frankfurt–Stuttgart–Zurich.	” ”
(15) Breslau – Gorlitz – Dresden – Leipzig – Erfurt – Cassel – Dorsten.	” ”
(16) Dresden – Berlin – Warnemunde – Malmo – Gothenburg – Oslo.	Junkers (Europa Union) in conjunction with the Swedish “ Aerotransport A.B.”

No definite statistics of the traffic carried out in 1924 are available.

As already mentioned, German air transport owes its rapid expansion largely to the interest shown by local authorities and local commercial interests. This interest takes practical form in the way of loans or grants to the operating companies, investments in the companies, and the provision of aerodromes. For example, the towns of Stuttgart, Breslau, Leipzig, Frankfurt, Baden, Essen, Mannheim and various others have invested in air transport undertakings, and towns throughout Germany have competed one with another in assisting the construction of aerodromes, either as municipal or commercial ventures.

Other branches of aviation are not being neglected. A body known as the " Luftrat," constituted as a voluntary Air Council, has been set up by the German Government to supervise all forms of aviation activity other than air transport and aircraft construction. This council comprises 35 members, representative of the Ministry of Transport, Army and Police authorities, Ex-Service Pilots' Association, Employers' Union, Scientific Association, Air League, and a Training organisation.

The encouragement and control of flying competitions is delegated by the " Luftrat " to the Aero Club of Germany, but the " Luftrat " retains the supreme authority.

For the co-ordination of training activities, the " Luftrat " acts through the medium of an organisation entitled the " Sportflug, G.m.b.H.," the purpose of which is to foster the work of flying schools and establish a uniform and efficient standard of training. There are at present about 30 flying schools in operation in Germany.

Several important competitions are being organised to take place in 1925 and a total sum of approximately 500,000 mks. (25,000*l.*) has been collected as prizes. The principal competitions are as follows :—

Deutsche Rundflug Competition.	
" Berliner Zeitung " Prize - - - -	110,000 mks.
Bœlke Prize - - - - - -	50,000 ,,
Otto Lilienthal Prize - - - - -	105,000 ,,
Richthofen Prize - - - - -	45,000 ,,
Munich Traffic Exhibition Competitions.	
Prizes - - - - - - -	100,000 ,,
Rhoen Gliding Competitions.	
Prizes - - - - - - -	45,000 ,,

HOLLAND.

The following services were operated by the Koninklijke Luchtvaart Maatschappij voor Nederland en Kolonien (K.L.M.) during the year under review :—

Amsterdam–Rotterdam–London.—(Daily return service.)

Amsterdam–Rotterdam–Paris.—(Daily return service with exception of period 1st June–1st October, when a double daily return service was operated.)

Rotterdam – Amsterdam – Hamburg – Copenhagen.—(Daily return service operated in conjunction with Deutscher Aero Lloyd (Germany) and Danske Luftfartselskab (Denmark) from 23rd April to 6th October.)

As stated in the previous report the K.L.M. is working under a subsidy scheme of four years' duration whereby the company is to receive from the Netherlands Government a subsidy of 1,400,000 florins, spread over the years 1923-1926. For the first two years the subsidy amounted to 400,000 florins per annum. For 1925 and 1926 the payments will be 300,000 florins per annum.

The following are statistics of international air transport by Netherlands aircraft in 1924 :—

No. of flights - - - - -	1,599
No. of hours flown - - - -	5,722
No. of passengers carried - -	3,225
Weight of goods carried (tons) -	140
Miles flown - - - - - -	482,800

A flight from the Netherlands to the Dutch East Indies was commenced from Amsterdam on 1st October in a Fokker F.VII machine with a British Rolls-Royce engine, piloted by Herr Van der Hoop. To give the machine a thorough test before the flight it had been operated on the Amsterdam–London service.

A forced landing at Philippopolis, between Belgrade and Constantinople, necessitated the fitting of a new engine and caused several weeks' delay. At the beginning of November the flight was resumed, and from this point it was carried out without incident, and the machine arrived at Batavia on 24th November.

The K.L.M. in the early part of 1924 applied for the grant of a concession and subsidy for the operation of an air service in the Netherlands East Indies. After careful consideration the Government of N.E.I. decided on the grounds of economy that no subsidy could at present be afforded.

HUNGARY.

Two Hungarian companies continued to carry out regular services on the Vienna–Budapest route. The following figures show the traffic forthcoming on this route in 1924 :—

——	Flights.	Passengers carried.	Goods carried.	Miles flown.
			Tons.	
Hungarian Air Traffic Co. - -	335	696	7·2	45,650
Hungarian Air Express Co. in conjunction with Austrian Air Traffic Co. (members of the Trans-Europa Union).	951	1,988	4·6	179,760

In May, 1924, the Hungarian Government established an Aerocartography Section of the Institute of Cartography, at

Szekesfehervar. The work for which the section is officially responsible is the revision of survey maps by the aid of aerial photography on behalf of the Hungarian Ministry of Finance, and this is carried out by means of two school aeroplanes lent by the Hungarian Air Traffic Co.

ITALY.

A policy for the development of air transport has been settled upon the following lines :—

A main trunk air line will be formed stretching from the extreme west of the Mediterranean (where connection will be made eventually with services to South America) to Barcelona and Genoa, thence branching off into two directions (i) to Pavia, Trieste and Vienna, and (ii) to Rome, Brindisi, Athens and Constantinople.

Certain sectors of this trunk line are already being organised. The most advanced is the Brindisi-Constantinople sector which it is hoped will be opened in July, 1925. The company responsible for this sector, the " Societa Aero-Expressa Italiano," is negotiating agreements with the Greek and Turkish Governments and is to receive a subsidy from the Italian Government for a period of ten years. The system of subsidy is as follows :—

A kilometric bonus will be paid in respect of every completed flight, calculated during the first three years at 75 per cent. of estimated running costs, during the next four years at 60 per cent., and during the eighth, ninth and tenth years at 45 per cent., up to a maximum of 315,000 kms. flown per annum. Should the services be increased so that the company flies more than 315,000 kms. per annum, the sum payable to the company for the extra flying will be diminished by 25 per cent. for every km. flown over 315,000 km., but below 472,501 km., and by 45 per cent. for every km. over 472,500 km., but below 945,001 km. Further, the company is to receive, in addition, an efficiency grant of 800,000 lire annually, on condition that one half at least of the aircraft shall always be in a condition of readiness for flight at the demand of the Government.

Negotiations are proceeding with regard to the Trieste–Vienna, Genoa–Barcelona and Rome–Brindisi sectors, and also an additional line, Turin–Trieste. Good progress is being made with the latter.

A sum of 15 million lire has been allocated by the Italian Government as subsidies in 1925-26. This sum will be sufficient for the Brindisi–Constantinople service and partly for the Trieste–Turin and Trieste–Genoa services. It is anticipated that a supplementary vote will be required.

Prizes to the total value of 300,000 lire were offered by the Italian Government to Italian pilots who established national or international records of certain classes during 1924.

Other prizes offered by the Italian Government include :—

800,000 lire in prizes for a Helicopter Competition (National).
100,000 lire in prizes for Glider Competitions (National).
100,000 lire in prizes for an Aircraft Landing Brake Competition (International).
1,000,000 lire in prizes to Italian Aero-Engine Constructors successful in the French Aero-Engine Competition.

The National Aeronautical Corporation has been transformed into a new body known as the National Air League (L.N.A.), which has taken over the principal functions of the Corporation in regard to training schools for pilots and technical personnel and propaganda.

NORWAY.

An air transport company, under the title " Norsk Lufttrafik " was founded in May, 1924, with the object of operating a service between Oslo and Copenhagen. Up to the present, however, this service has not materialised.

The grant of a sum of 14,000 kroner has been approved by the Storting Posts and Telegraphs Committee as a subsidy for civil air traffic for the 1925-6 financial year.

An attempt to reach the North Pole by air is being organised by Roald Amundsen. Two large seaplanes of German Dornier design fitted with British Rolls-Royce engines will be employed.

(*Note.*—The attempt was commenced on 21st May, 1925. The machines landed at a point approximately 158 miles from the Pole. Owing to the state of the ice it was extremely difficult to get the machines into the air again. Eventually, after a prolonged and arduous struggle, Amundsen succeeded in clearing a track for the take-off of one machine and returned safely with his whole party.)

POLAND.

The Ministry of Railways, which controls civil aviation in Poland, has adopted the policy of subsidising civil air transport by means of a free grant of petrol. The principal Polish air transport company is the " Polski Aerlot " (formerly " Polski Aero Lloyd "), which operates regular services from Danzig to Warsaw, Warsaw to Lemberg, and Warsaw to Cracow. The first two of these services were started in 1922 and the last in 1923.

This company proposes to organise a seaplane service from Danzig to Malmo and Copenhagen, *viâ* the Island of Bornholm. The proposal was discussed at a meeting between representatives of the Danish, Polish and Swedish Governments held at Copenhagen at the end of March, 1925, when it was decided that the three Governments concerned should be requested to grant the Polski Aerolot a concession for operating the route for a period of ten years. The co-operation of a Danish and a Swedish company was invited by the Poles, and the concessions, if granted, will contain a clause whereby Denmark and Sweden shall, under certain conditions, be entitled to take a share in the operation of the route if they so desire.

The Polski Aerolot has also secured concessions from its own Government for the extension of its lines from Lemberg to the Roumanian frontier *viâ* Czernowitz and from Cracow to the Czechoslovak frontier, and has applied for a concession for the line Warsaw–Kattowitz–German frontier (for connection with Vienna).

The following statistics of the Polski Aerolot show the growth of the traffic on the company's lines :—

	1922.	1923.	1924.
Passengers carried	500	1,650	1,236
Weight of goods carried (in lbs.)	20,900	27,720	67,530
Weight of letters carried (in lbs.)	1,540	880	827
Distance flown (in miles)	52,250	112,500	124,203

The line Warsaw-Posen (for connection with Berlin) is being organised by the Aero Company of Posen, which proposes to employ Farman aircraft, and the line Warsaw–Russian frontier (for connection with Moscow) has been taken up by the Aerotransport Company of Warsaw.

SOVIET RUSSIA.

The Society of Friends of the Air Fleet has continued its intensive propaganda to arouse public interest and attract subscriptions for the furtherance of aviation schemes.

The principal Russian air traffic companies are the "Dobrolet," the "Ukrvozdukhput" (Ukrainian–Crimean Air Traffic Company) and the "Zakavia" (Trans-Caucasian Air Company). The following services functioned with fair regularity during 1924 :—

Moscow–Nijhni–Novgorod—Kazan (Dobrolet).
Tashkent–Alma Ata (Dobrolet).
Kharkoff–Kiev, Kkarkoff–Odessa (Ukrvozdukhput).
Tiflis–Baku (Zakavia).

The Konigsberg–Moscow air service, operated by the Russo-German company Deutsche-Russische Luftverkehrs A.G. ("Deruluft"), completed its third season of regular working.

The Russian air transport branch of Junkers-Werke A. G. of Dessau carried out preliminary work with a view to establishing a service Baku–Enzeli–Tehran–Bushire. The Moscow–Tiflis service which was run for a short period in the previous year by the same company was unable to recommence owing to lack of passengers.

A grant of 1,000,000 roubles was made by the Russian Government in 1924 for the purpose of developing the aviation industry.

The following statistics show the work done by the different companies during 1924 :—

——	No. of flights.	Passengers carried.	Goods carried.	Mileage.
			Tons.	
Deruluft	235	653	31	175,500
Dobrolet	204	456	5	54,350
Ukrvozdukhput	118	347	0·8	34,750
Zakavia	308	997	8	24,000
TOTAL	865	2,453	44·8	288,600

SWEDEN.

The Aerotransport A.B., whose formation was reported in the last report, commenced activities on 2nd June, 1924, when the Stockholm-Helsingfors line was opened for the conveyance of goods and passengers. The Swedish Post Office granted the company a concession for the carriage of air mails as from 23rd June, 1924, but owing to the small amount of mail carried and the decision of the Finnish Government not to grant a subsidy the service was suspended on 1st September. (*See also* under Finland).

The Malmo–Hamburg service was inaugurated on 1st July, in conjunction with the Deutscher Aero Lloyd. At Hamburg the line connected with a service to Amsterdam and London. The service remained in operation until 5th October, and during this period carried out 186 flights, covering a distance of 59,900 kms. and transporting 334 passengers and 760 kgs. of mail.

A service between Malmo and Copenhagen was opened on 9th July, three return services being carried out daily. The service was operated regularly until 20th February when it was suspended for the remainder of the winter. During the period of operation 1,066 flights were made and 2,580 passengers conveyed.

As a result of an application by the Aerotransport A.B. for a Government subsidy spread over a period of ten years, a committee of air traffic experts was appointed by the Swedish Government to consider the question of State subsidisation of regular Swedish air traffic. After consideration of the recommendations of this committee, a scheme has been outlined by the Swedish Cabinet for the 1925–6 financial year on the following lines :—

It is proposed that a special grant of 500,000 kroner should be devoted to the support of regular air traffic, and that a grant of 128,000 kroner should be used for improving the Bulltoftafalt aerodrome, Malmo, and a further grant of 4,000 kroner made for the meteorological service. It is further proposed that a special fund, known as the " Aviation Loan Fund " should be arranged from which bonus would be granted for the purchase of aircraft and aero-engines. The amount to be devoted to this fund for the coming financial year should be 800,000 kroner.

Under these proposals, the lines to be subsidised would be: the Malmo–Hamburg line, with extension to Amsterdam, over a period of 6 months; the Stockholm–Helsingfors line, over a period of 4 months, and the Oslo–Gothenburg–Copenhagen line, over a period of 3 months. The amount of subsidy for the Malmo–Amsterdam line is calculated as about 378,000 kroner if the line is operated solely by Swedish enterprise, and as about 227,000 kroner if operated jointly by Swedish and Danish enterprise. The air lines Stockholm–Helsingfors and Oslo–Copenhagen would be operated respectively in co-operation with Finland and Norway, hence the amount of the subsidy for each line is calculated at about 60,000 kroner.

At the instigation of the Aerotransport A.B. a conference of representatives of the Scandinavian air traffic companies was held at Stockholm in January, 1925, and resulted in the formation of a Scandinavian Air Traffic Union, with the objects of (1) preventing competition between the companies of the Scandinavian countries, (2) strengthening their position in relation to the air companies of foreign countries, and (3) making air traffic a commercially remunerative enterprise.

An additional activity of the Aerotransport A.B. was the formation of a company, with Lieut. A. Florman at the head, for the construction of Junkers aeroplanes under licence in Sweden. A factory has been erected at Limhamn, near Malmo, and has already commenced the construction of machines.

An indication of the interest of aviation in Sweden is shown by the submission to the Government early in 1925 of a proposal, signed by representatives of some of the country's most important industries and the leading shipowner, offering their technical resources to assist in investigating the best lines of development of Sweden's aircraft industry. The document refers to aircraft construction in association with the State, utilising Swedish materials, and to the development of an independent Swedish aircraft industry which may be able eventually to compete in foreign markets.

SWITZERLAND.

The sum of 50,000 francs was set aside in the Federal Budget of 1924 for the promotion of civil aviation in Switzerland. Subsidies were also paid by the Post Office and various cantons and towns.

As a result of negotiations which took place in the spring of 1924 between representatives of the Federal Air Office, the Post

Office, the Cantons of Basle and Zurich and the Town of Zurich, the following subsidies were fixed :—

(1) *London–Paris–Basle–Zurich Service.* (Imperial Airways.)

The subsidy was fixed at 560 frs. per flight, for a maximum number of 120 flights, and was divided as follows :—

Post Office - - - - - -	200 frs. per flight.
Canton of Basle - - - -	180 ,, ,,
Town and Canton of Zurich - -	180 ,, ,,
Total - - - -	560 ,, ,,

(2) *The Geneva–Zurich–Munich and Zurich–Munich–Vienna Services.* (Ad Astra.)

Total subsidy for the two services, 80,500 frs., divided as follows :—

Federal Air Office - - - - -	30,000 frs.
Post Office - - - - - - -	27,500 ,,
Canton and Town of Zurich - - -	23,000 ,,
Total - - - -	80,500 ,,

The Federal Post Office expended altogether 134,810 frs. on Air Post Services during 1924, as against 76,201 frs. in 1923. In spite of unfavourable weather conditions, flights were carried out with satisfactory regularity, the number of letters transported amounting to 53,805 and the number of parcels amounting to 279.

A new service was inaugurated by the "Aero-Lausanne S.A." over the route Lausanne–Geneva–Lyons on 1st June, 1924, this being the first international line operated entirely under Swiss control. The service received financial support from the Confederation, the Canton of Vaud, the Town of Lausanne, the Canton of Geneva and the Town of Lyons. The service was suspended for the winter on 23rd September, 1924. The line had a connection at Geneva with the Geneva–Zurich–Munich line, and was used for the forwarding of mail by both the Swiss and French authorities.

As from 11th September, 1924, the "Genossenschaft Aviatik beider Basel" operated local services over the route Berne–Basle. The programme provided for one service each way daily for connection with the Basle–Brussels–Rotterdam–Amsterdam, and a second service leaving Berne on Mondays, Wednesdays and Fridays, and returning on Tuesdays, Thursdays and Saturdays for connection with the Paris–London machines.

The traffic in 1924 of all international air transport services terminating in Switzerland amounted to, approximately :—

Flights.	Passengers carried.	Miles flown.
1,795	3,026	268,400

The Swiss company, Aero-Lausanne, S.A., operating on the line Lausanne–Geneva–Lyons, contributed to these figures: 306 flights, 306 passengers carried, and 18,980 miles flown.

A Swiss pilot, Ober-Lt. W. Mittelholzer, on a German Junkers machine, flew from Zurich to Tehran, Persia, between 18th December, 1924, and 29th January, 1925.

A provisional air traffic agreement has been concluded between Switzerland and Holland.

TURKEY.

After numerous attempts by both the French "Cie. Franco Roumaine" and the German Junkers Company to secure a concession for the operation of commercial air services in Turkey, an arrangement was eventually arrived at whereby both companies were to operate services over the Constantinople–Angora route for a period of three months, commencing in September, 1924, the decision regarding the granting of concessions to be based on the results of these services. The Cie. Franco Roumaine maintained a fairly regular service over the route during the stipulated period, but the Junkers Company appears to have given up after one or two flights. The Cie. Franco Roumaine (now known as the C.I.D.N.A.) was also granted temporary permission to operate a service from Constantinople to Bucharest, as an extension of its service from Paris. No decision as to the grant of a concession to either company has yet been made.

The proposals submitted by the Junkers Company included, in addition to air transport services, the establishment of an aircraft factory in Turkey and the training of pilots.

The San Stephano aerodrome, originally built by the French, has been taken over by the Turkish authorities, and is to be maintained by them as the Customs aerodrome for Constantinople.

ASIA.

JAPAN.

Air mail services are being organised on the lines Tokyo–Osaka (to save 9½ hours) and Osaka–Fukuoka (to save 10 hours). The services will be run by private companies working under contract with the Government.

There are 13 civil training schools in Japan, all of which are controlled by the Government and receive a subsidy. The progress being made is shown by the numbers of licensed civilian pilots turned out by these schools, *i.e.* :—

Licensed Pilots.

Date.	1st Class.	2nd Class.	3rd Class.	Total.
1921 - - -	5	3	3	11
1922 - - -	8	17	24	49
1923 - - -	18	24	37	79
1924 - - -	25	39	58	122

PERSIA.

The Junkers Company of Germany has presented proposals to the Persian Government for the establishment of air transport services in Persia. No agreement has yet been reached in the matter, but negotiations are still in progress.

AMERICAN CONTINENT.

ARGENTINA.

The River Plate Aviation Co., an English company, which commenced a daily mail and passenger service in January, 1924, between Buenos Aires and Montevideo, and operated successfully for three months, was compelled to cease operations owing to the inadequacy of the subsidy provided by the Argentine Government.

On 7th January, 1925, the German Junkers Company commenced the operation of a regular air service between Cordoba and Villa Dolores. Machines run three times per week in each direction. So far this route has proved very successful, and other Junkers services are being planned.

Progress had been made in connection with a French proposal or an air mail service between France and Buenos Aires. (For details *see* under France.)

A small civil aviation enterprise has been operated by a Mr. Holland, who possesses one aeroplane. Mr. Holland's chief activity is aerial photography. A photographic mosaic of the port, docks, waterfront and a portion of the city of Buenos Aires has already been made, and a project to have the whole city photographed in this manner has been approved by the municipal authorities.

Aero clubs have been formed in most of the principal towns and in several comparatively small towns. In a number of instances the Government have assisted the clubs, generally by giving or selling cheaply aeroplanes and material for instructional purposes, as well as providing flying instructors and mechanics.

CHILE.

M. Luis Testart, a Frenchman, has obtained a concession for a period of 12 years for the operation of a service between Iquique–Concepcion and Santiago–Valparaiso.

COLUMBIA.

The Sociedad Colombo–Alemana de Transportes Aereos (S.C.A.D.T.A.) since its establishment in 1921 up to the autumn of 1924, on its seaplane services along the Magdalena River, had covered 368,530 miles, carried 2,830 passengers, and 14·3 tons of mail. The development between 1920 and 1924 is shown by the following figures :—

	1920.	1924.
Mileage	2,700	169,500
Hours flown	36	1,956
Air mail, lbs.	110	235,268
Passengers	12	1,084
Total pay load, tons	1	91

The following lines are operated by the company :—

Barranquilla–Girardot, 625 miles, 8½ hours by seaplane, 8–15 days by steamer.

Girardot–Neiva, 94 miles, 70 minutes by seaplane, 4 days by mule pack.

Barranquilla–Cartagena, 75 miles, 60 minutes by seaplane.

Medellin–Cali, 200 miles, 3 hours by seaplane.

Puerto Wilches–Bucaramanga, 75 miles, 60 minutes by seaplane, 4 days by mule pack.

By a law passed in November, 1924, the company is to receive a grant of 60,000 pesos from the Colombian Government.

An important air survey has been carried out by the company of an area of 3,500 square miles on the frontier of Venezuela and Colombia—a frontier which has long been in dispute. In 16 days the photography was completed at a cost reported to be $20,000. It is estimated that this survey would have taken two years to complete by ground methods.

U.S.A.

The vote for the Post Office Air Mail Service for the year ending 30th June, 1925, was $2,750,000, as compared with $1,500,000 in the previous year.

The through air mail service New York–San Francisco was inaugurated on 1st July, 1924. The night-flying portion of the route now extends to nearly 1,600 miles, from Chicago to Cleveland in the East, and from Cheyenne to Rock Springs in the West.

An extension from Cleveland to New York has been decided upon, and when completed an overnight air mail service will be run between Chicago and New York.

During the fiscal year ended 30th June, 1924, 1,853,251 miles were flown by the air mail service, carrying an estimated total of 60,001,360 pieces of first-class mail.

An experimental air mail service from Fairbanks to McGrath, Alaska, was run early in 1924.

The Kelly Bill which was put forward in February, 1924, and became law on 2nd February, 1925, authorises the Postmaster-General to contract with any individual, firm, or corporation for the transportation of air mail between such points as he may designate at a rate not to exceed four-fifths of the revenue derived from such mail, and further to contract for the transportation by aircraft of first-class mail other than air mail at a rate not to exceed four-fifths of the revenue derived from such first-class mail. The most important provisions of the regulations issued by the Postmaster-General in connection with his new powers are as follows :

(1) That schemes for air mail routes may be originated by the postmasters concerned and forwarded to the Postmaster-General, together with information relating to the necessity for the establishment of such a route, estimates of probable traffic, etc.

(2) Contractors on such routes may carry packages and passengers, but must give preference to air mail on all trips.

(3) Individuals entering into such contracts must be American citizens, and must furnish evidence that at least 75 per cent. of their capital stock is owned by American citizens. Aircraft used in connection with such contracts must have been manufactured in the U.S.A.

(4) Postage rates for contract air mail services will be 10 cents for each ounce or fraction of an ounce on routes of 1,000 miles or less, 15 cents on routes over 1,000 miles and less than 1,500 miles, and 20 cents on routes over 1,500 miles.

(5) Such land lighthouses, emergency landing fields, radio stations, other means of communication, and other aids to navigation as may be necessary for the proper navigating of aircraft of these contractors must be provided for by the contractors.

The use of aeroplanes for the dusting of cotton crops with calcium arsenate powder as a protection against the boll weevil has been tested with promising results, and a company has been formed to undertake the work on a considerable scale. If this new method of dusting proves economically effective it may involve the employment of several hundred machines, as the cotton fields cover a large proportion of the Southern States and the dusting has to be carried out at a certain season within a relatively short space of time.

A flight round the world was completed by two machines of the United States Naval Air Service. The flight officially started from Seattle on 6th April, 1924. Four aeroplanes were engaged, piloted by Major F. L. Martin (leader of the expedition), Lt. L. Smith, Lt. E. Nelson, and Lt. L. Wade. Major Martin crashed soon after the start, and had to abandon his part in the flight. On 2nd May the other three machines, then in the Aleutian Islands, resumed with Lt. Smith in charge.

The principal stopping places and dates of arrival of the three machines until they reached England were as follows :—Tokio—22nd May; Shanghai—5th June; Rangoon—20th June;

Calcutta—26th June; Karachi—4th July; Constantinople—11th July; Croydon—16th July.

From Croydon the machines flew to Brough, where they were overhauled and fitted with floats for the crossing of the Atlantic *viâ* Iceland and Greenland. On 30th July, the machines flew to the Orkneys and on 2nd August set out for Iceland. Only Lt. Nelson, however, reached his destination on that day. Lt. Smith arrived after a fresh start on the following day, but Lt. Wade was forced down and had to fall out of the flight. From this point the two remaining machines flew by way of Reykjavik, Frederiksdal, Ivigtut, Icetickle to Pictou (Nova Scotia), which was reached on 3rd September, and here Lt. Wade, furnished with a new machine, rejoined the expedition.

New York was reached on 8th September and Washington on 9th September. The flight terminated at Seattle on 28th September. The total elapsed time for the flight was 175 days; mileage, 27,534; days actually in the air, 66; actual flying time, 351 hrs. 11 mins.; average speed, 76·36 m.p.h.

(Signed) W. S. BRANCKER.

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